

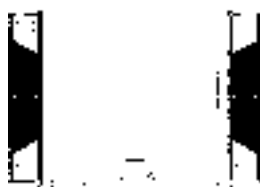
## SHARP

## SERVICE MANUAL

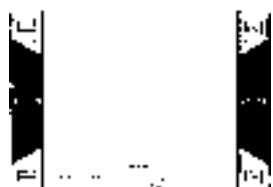
S00K414BM2S//



14BM2, 14BM2S/G



20BM2, 20BM2S/G



21BM2, 21BM2S/G

## COLOUR TELEVISION

Chassis No. UA-1

14BM2, 14BM2S/G

20BM2, 20BM2S/G

MODELS 21BM2, 21BM2S/G

In the interests of user-safety (Required by safety regulations in some countries) the set should be restored to its original condition and only parts identical to those specified should be used.

## FEATURE

- Multi 18 Systems
- Full Auto Channel Preset and Auto Channel Skip
- 100-CH Program Memory
- High Contrast Picture
- Black Stretch Circuit
- CATV (Hyper Band) Ready  
(Used Frequency Synthesizer Tuner)
- Hotel Mode
- On Timer/Sleep Timer/Reminder Timer
- Colour Comb Filter Function (NTSC only)
- Blue Back Noise Mute
- Front AV-In & Rear AV-In/Out Terminals
- AVL Function
- English/Chinese/Malay/France/Russia/Arabic OSD

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## WARNING

The chassis in this receiver is partially hot. Use an isolation transformer between the line cord plug and power receptacle, when servicing this chassis. To prevent electric shock, do not remove cover. No user – serviceable parts inside. Refer servicing to qualified service personnel.

SHARP CORPORATION

## SPECIFICATIONS

Convergence .....	Self Convergence System
Focus .....	Electrostatic Focus High Bi-Potential
Sweep Deflection .....	Magnetic
Intermediate Frequencies	
Picture IF Carrier .....	38.9 MHz
Sound IF Carrier Frequency	
5.5 MHz .....	33.4 MHz
6.0 MHz .....	32.9 MHz
6.5 MHz .....	32.4 MHz
Colour Sub-Carrier Frequency .....	34.47 MHz
Power Input .....	110 - 240V, AC50/60 Hz
Power Consumption	
21BM2 .....	88 W
20BM2 .....	87 W
14BM2 .....	68 W
Audio Power Output Rating .....	5.0W (RMS)
Speaker	
Size	
21BM2/20BM2 .....	6 x 12 cm Elliptic (2 pcs.)
14BM2 .....	5 x 9 cm Elliptic (2 pcs.)
Voice Coil Impedance .....	6 ohms at 400 Hz
Aerial Input Impedance	
VHF/UHF .....	75 ohms Unbalanced
Receiving System .....	CCIR/PAL B/G, D/K, I/SECAM
	NTSC 3.58/4.43 MHz (thru AV)
Tuner Ranges	
• VHF-Channels .....	E1 (48.25 MHz) thru E12 (224.25 MHz)
	C1 (49.75 MHz) thru C12 (216.25 MHz)
	S1 (105.25 MHz) thru S41 (463.25 MHz)
• UHF-Channels .....	E21 (471.25 MHz) thru E69 (855.25 MHz)
	C13 (471.25MHz) thru C57 (863.25 MHz)
Dimensions	
21BM2 .....	Width: 642.0 mm
	Height: 475.0 mm
	Depth: 477.0 mm
	Weight (approx.): 21.0 kg
20BM2 .....	Width: 642.0 mm
	Height: 475.0 mm
	Depth: 480.0 mm
	Weight (approx.): 19.0 kg
14BM2 .....	Width: 496.0 mm
	Height: 355.0 mm
	Depth: 365.0 mm
	Weight (approx.): 9.2 kg
Cabinet Material .....	All Plastics

*Specifications are subject to change without prior notice.*

## IMPORTANT SERVICE NOTES

Maintenance and repair of this receiver should be done by qualified service personnel only.

### SERVICING OF HIGH VOLTAGE SYSTEM AND PICTURE TUBE

When servicing the high voltage system, remove static charge from it by connecting a 10k ohm Resistor in series with an insulated wire (such as a test probe) between picture tube dag and 2nd anode lead. (AC line cord should be disconnected from AC outlet.)

1. Picture tube in this receiver employs integral implosion protection.
2. Replace with tube of the same type number for continued safety.
3. Do not lift picture tube by the neck.
4. Handle the picture tube only when wearing shatterproof goggles and after discharging the high voltage completely

### X-RAY

This receiver is designed so that any X-Ray radiation is kept to an absolute minimum. Since certain malfunctions or servicing may produce potentially hazardous radiation with prolonged exposure at close range, the following precautions should be observed:

1. 14BM2 : When repairing the circuit, be sure not to increase the high voltage to more than 25.5 kV (at beam 0.1  $\mu$ A) for the set.
  - 20BM2 : When repairing the circuit, be sure not to increase the high voltage to more than 28.0 kV (at beam 0.1  $\mu$ A) for the set.
  - 21BM2 : When repairing the circuit, be sure not to increase the high voltage to more than 28.0 kV (at beam 0.1  $\mu$ A) for the set.
  2. 14BM2 : To keep the set in a normal operation, be sure to make it function on 22.8 kV  $\pm$  1.5 kV (at beam 800  $\mu$ A) in the case of the set. The set has been factory - Adjusted to the above-mentioned high voltage.
  - 20BM2 : To keep the set in a normal operation, be sure to make it function on 24.5 kV  $\pm$  1.5 kV (at beam 1,100  $\mu$ A) in the case of the set. The set has been factory - Adjusted to the above-mentioned high voltage.
  - 21BM2 : To keep the set in a normal operation, be sure to make it function on 24.8 kV  $\pm$  1.5 kV (at beam 1,100  $\mu$ A) in the case of the set. The set has been factory - Adjusted to the above-mentioned high voltage.
- ∴ If there is a possibility that the high voltage fluctuates as a result of the repairs, never forget to check for such high voltage after the work.
3. Do not substitute a picture tube with unauthorized types and/or brands which may cause excess X-ray radiation.

### BEFORE RETURNING THE RECEIVER

Before returning the receiver to the user, perform the following safety checks.

1. Inspect all lead dress to make certain that leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the receiver.
2. Inspect all protective devices such as non-metallic control knobs, insulating fishpapers, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacity networks, mechanical insulators etc.

# ADJUSTMENT PRECAUTIONS

This model's setting are adjusted in two different ways: though the I<sup>2</sup>C bus control and in the conventional analog manner. The adjustments via the I<sup>2</sup>C bus control include preset-only items and variable data.

## 1. Setting the service mode by the microprocessor.

- ① Short JA122 & JA124 for 1 second and release to switch to the service mode position, and the microprocessor is in input mode. (Adjustment through the I<sup>2</sup>C bus control). (Use JWS Key to set as well).
- ② Press the CH DOWN / UP key on the remote controller to get ready to select the mode one by one.
- ③ Press the CH DOWN / UP key on the remote controller to select the modes reversibly one by one.
- ④ Using the VOLUME UP / DOWN key on the remote controller, the data can be modified.
- ⑤ Short JA122 & JA124 for 1 second and release to switch to the normal mode (OFF) position, and the microprocessor is in out of the service mode.

## 2. Factory Presetting.

- ① Short JA122 & JA124 for 1 second and release to switch to the service mode position and turn on the main power switch. Initial values are automatically preset, only when a new EEPROM is used (Judge with the first 4 bytes).
- ② The initial data are preset as listed in pages 4, 5 & 6.
- ③ Make sure the data need modify or not (Initial data).

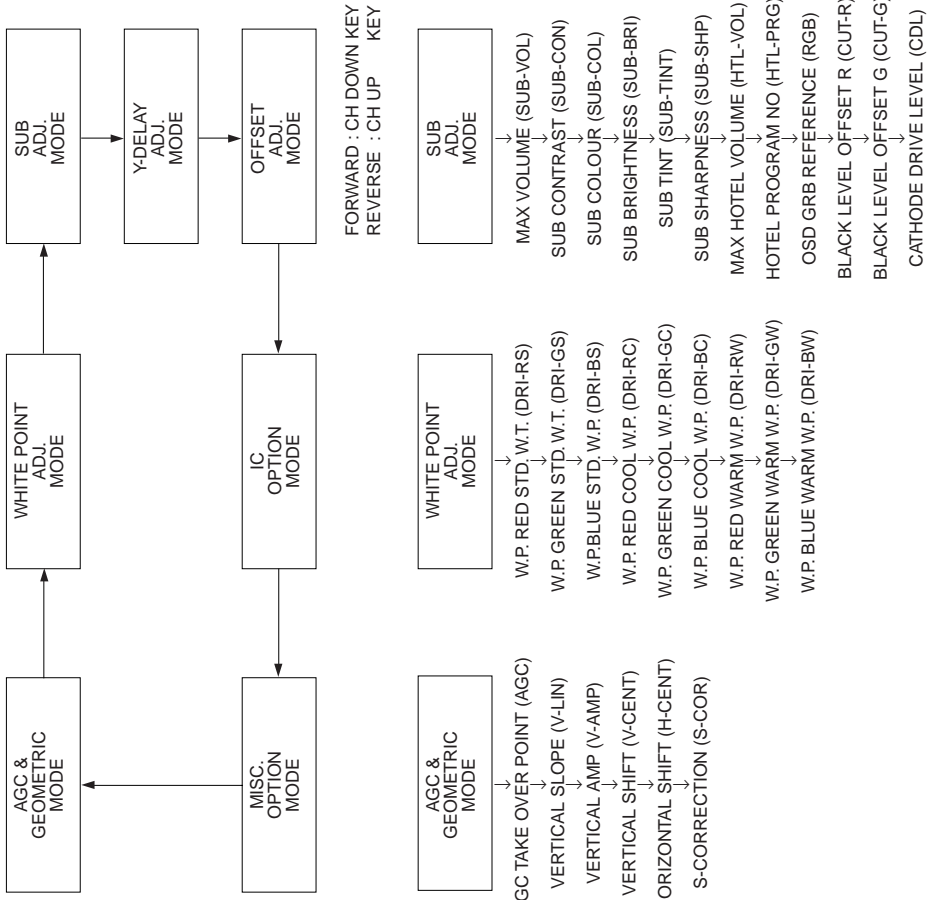
**Note:** Once the chassis has been assembly together and ready to be POWER ON for the FIRST TIME, make sure to short JA122 & JA124 switch to the service mode position first and then turn on the main power switch. (See 2-① above).

**Precaution:** If haven't done this initiation, it may possibly generate excessive Beam current.

## 3. For reference please check with memory map (UA1 Series type RH-IX3368CE Attachment)

### ■ SERVICE MODE

(1) In the Service Mode, Key is used to select the mode in the following order.



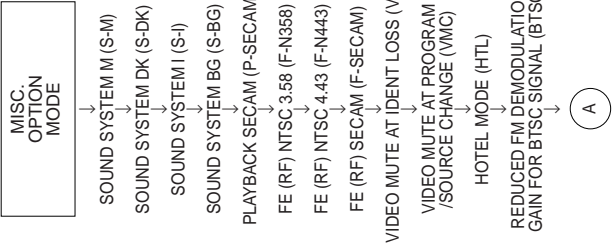
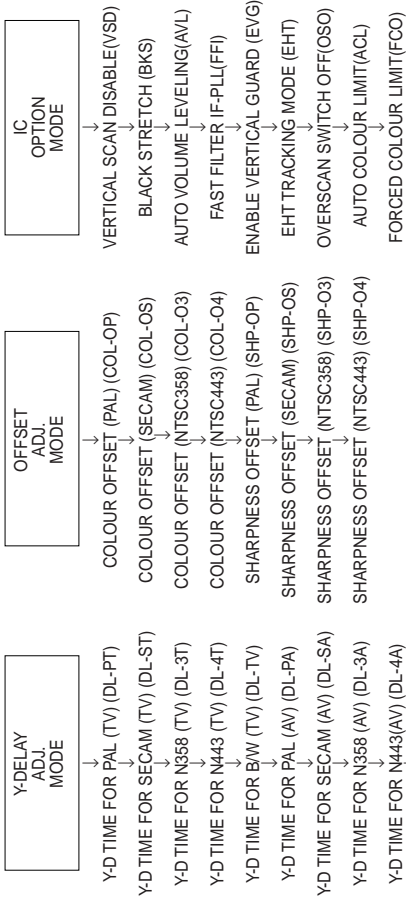
FORWARD : CH DOWN KEY  
REVERSE : CH UP KEY  
\* ( ) means OSD display.

# USER DATA IN SERVICE MODE

- \* While SERVICE mode ON, EEPROM DATA will switch to the service data.
- Also, once SERVICE mode OFF, EEPROM will switch back to previous USER DATA.
- \* In the service mode, the user data establish as below,

MODE	USER DATA
CONTRAST	MIN (1/60)
COLOUR	MIN (1/60)
BRIGHTNESS	MIN (1/60)
TINT	MIN (1/60)
SHARPNESS	MIN (1/60)
WHITE TEMP	STANDARD
S-VOLUME	MIN (1/60)
BLUE BACK	OFF
C SYSTEM	AUTO
S SYSTEM	*1

\*1 : For each CH, before changing service mode setting.



The flow of Mode lists as following,

- \* Direct Key-in Step1 Mode

RC COMMAND	SERVICE-ITEM
FUNCTION	AGC
CONTRAST DOWN	V-LIN
COLOUR DOWN	V-AMP
BRIGHTNESS DOWN	V-CENT
TINT DOWN	H-CENT
SHARPNESS DOWN	EW / /
SYSTEM	HB
BLUEBACK	S-COR
TIMER	SUB-VOL
CONTRAST UP	SUB-CON
COLOUR UP	SUB-COL
BRIGHTNESS UP	SUB-BRI
TINT UP TINT	SUB TINT
SHARPNESS UP	SUB-SHP

After short JA122 & 124, and turn on the main power switch, read data from E<sup>2</sup>PROM address 00H ~ 03H, and compare to the list below, if different, initialize the E<sup>2</sup>PROM.

Address : Data  
00H : 55H : 43H  
01H : 4FH : A1H

EEPROM ITEMS		OSD	DATA LENGTH	INITIAL DATA	FIX/ADJ	REMARK
AGC TAKE OVER POINT		AGC	0-63	14	ADJ	
VERTICAL SLOPE		V-LIN	0-63	32	ADJ	
VERTICAL AMPLITUDE		V-AMP	0-63	32	ADJ	
VERTICAL SHIFT		V-CENT	0-63	32	ADJ	
HORIZONTAL SHIFT		H-CENT	0-63	32	ADJ	
S-CORRECTION		S-COR	0-63	0	FIX	
WHITE POINT RED STD WHITE TEMP		DRI-RS	0-63	32	FIX	
WHITE POINT GREEN STD WHITE TEMP		DRI-GS	0-63	32	ADJ	
WHITE POINT BLUE STD WHITE TEMP		DRI-Bs	0-63	32	ADJ	
WHITE POINT RED COOL WHITE TEMP		DRI-RC	0-63	25	ADJ	(DRI-RS)-7 *1
WHITE POINT GREEN COOL WHITE TEMP		DRI-GC	0-63	32	ADJ	(DRI-RS)-7 *1
WHITE POINT BLUE COOL WHITE TEMP		DRI-BC	0-63	32	ADJ	(DRI-RS)-7 *1
WHITE POINT RED WARM WHITE TEMP		DRI-RW	0-63	32	FIX	(DRI-RS)
WHITE POINT GREEN WARM WHITE TEMP		DRI-GW	0-63	32	ADJ	(DRI-GS)-7
WHITE POINT BLUE WARM WHITE TEMP		DRI-BW	0-63	32	ADJ	(DRI-RS)-7
MAX VOLUME		SUB-VOL	0-63	32	FIX	
SUB CONTRAST		SUB-CON	0-63	63	FIX	
SUB COLOUR		SUB-COL	0-63	32	ADJ	
SUB BRIGHTNESS		SUB-BRI	0-63	32	ADJ	
SUB TINT		SUB-TINT	0-63	32	ADJ	
SUB SHARPNESS		SUB-SHP	0-63	32	FIX	
MAX HOTEL VOLUME		HTL-VOL	0-63	32	FIX	
OSD GRB REFERENCE		HTL-PRG	0-99 OR>99 FOR NONE	255	FIX	
RGB		RGB	0-15	15	FIX	
CUT-R		CUT-R	0-15	8	ADJ	
CUT-G		CUT-G	0-15	8	ADJ	
CATHODE DRIVE LEVEL		CDL	0-15	0(2)	FIX	*2
Y-DELAY TIME FOR PAL(TV) [YD]		DL-PT	0-15	12	FIX	
Y-DELAY TIME FOR SECAM(TV) [YD]		DL-ST	0-15	15	FIX	
Y-DELAY TIME FOR N358 (TV) [YD]		DL-3T	0-15	12	FIX	
Y-DELAY TIME FOR N443 (TV) [YD]		DL-4T	0-15	12	FIX	
Y-DELAY TIME FOR BW (TV) [YD]		DL-TV	0-15	12	FIX	
Y-DELAY TIME FOR PAL (AV) [YD]		DL-PA	0-15	12	FIX	
Y-DELAY TIME FOR SECAM (AV) [YD]		DL-SA	0-15	15	FIX	
Y-DELAY TIME FOR N358 (AV) [YD]		DL-3A	0-15	12	FIX	
Y-DELAY TIME FOR N443 (AV) [YD]		DL-4A	0-15	12	FIX	
Y-DELAY TIME FOR BW (AV) [YD]		DL-AV	0-15	12	FIX	
COLOUR OFFSET (PAL)		COL-OP	0-15	8	FIX	
COLOUR OFFSET (SECAM)		COL-OS	0-15	8	FIX	
COLOUR OFFSET (NTSC358)		COL-O3	0-15	4	FIX	
COLOUR OFFSET (NTSC443)		COL-O4	0-15	4	FIX	
SHARPNESS OFFSET (PAL)		SHP-OP	0-15	8	FIX	
SHARPNESS OFFSET (SECAM)		SHP-OS	0-15	4	FIX	

EEPROM ITEMS	OSD	DATA LENGTH	INITIAL DATA	FIX/ADJ	REMARK
SHARPNESS OFFSET (NTSC358)	SHP-O3	0-15	12	FIX	
SHARPNESS OFFSET (NTSC443)	SHP-O4	0-15	8	FIX	
VERTICAL SCAN DISABLE	VSD	0(DISABLE)/1(ENABLE)	0	FIX	
BLACK STRETCH	BKS	0(DISABLE)/1(ENABLE)	1	FIX	
AUTOMATIC VOLUME LEVELING	AVL	0(DISABLE)/1(ENABLE)	1	FIX	
FAST FILTER IF-PLL	FFI	0(DISABLE)/1(ENABLE)	0	FIX	
ENABLE VERTICAL GUARD (RGB BLANKING)	EVG	0(DISABLE)/1(ENABLE)	1	FIX	ONLY BLK
EHT TRACKING MODE (HCO)	EHT	0(DISABLE)/1(ENABLE)	1	FIX	
OVERSCAN SWITCH OFF	OSO	0(DISABLE)/1(ENABLE)	0	FIX	
AUTO COLOUR LIMIT	ACL	0(DISABLE)/1(ENABLE)	0	FIX	
FORCED COLOUR LIMIT	FOO	0(DISABLE)/1(ENABLE)	0	FIX	
SOUND SYSTEM M	S-M	0(DISABLE)/1(ENABLE)	0	FIX	
SOUND SYSTEM DK	S-DK	0(DISABLE)/1(ENABLE)	1	FIX	
SOUND SYSTEM I	S-I	0(DISABLE)/1(ENABLE)	1	FIX	
SOUND SYSTEM BG	S-BG	0(DISABLE)/1(ENABLE)	1	FIX	
PLAYBACK SECAM	P-SECAM	0(DISABLE)/1(ENABLE)	1	FIX	
FE (RF) NTSC 3.58	F-N358	0(DISABLE)/1(ENABLE)	0	FIX	
FE (RF) NTSC 4.43	F-N443	0(DISABLE)/1(ENABLE)	1	FIX	
FE (RF) SECAM	F-SECAM	0(DISABLE)/1(ENABLE)	1	FIX	
VIDEO MUTE AT IDENT LOSS	VMI	0(DISABLE)/1(ENABLE)	1	FIX	
VIDEO MUTE AT PROGRAM/SOURCE CHANGE	VMC	0(DISABLE)/1(ENABLE)	1	FIX	
HOTEL MODE	HTL	0(DISABLE)/1(ENABLE)	0	FIX	
REDUCED FM DEMODULATOR GAIN FOR BTSC SIGNAL	BTSC	0(DISABLE)/1(ENABLE)	0	FIX	
NUMBER OF EXTERNAL AV SOURCE	AV	0 FOR 1 AV/1 FOR 2AV	1	FIX	
FM WINDOW SELECTION	FMWS	0(DISABLE)/1(ENABLE)	0	FIX	
SOUND MUTE BIT 0	SM0	0(DISABLE)/1(ENABLE)	1	FIX	
SOUND MUTE BIT 1	SM1	0(DISABLE)/1(ENABLE)	0	FIX	
THAI LANGUAGE	THA	0(DISABLE)/1(ENABLE)	0	FIX	
ARABIC LANGUAGE	ARA	0(DISABLE)/1(ENABLE)	1	FIX	
MALAY LANGUAGE	MAL	0(DISABLE)/1(ENABLE)	1	FIX	
CHINESE LANGUAGE	CHI	0(DISABLE)/1(ENABLE)	1	FIX	
FRENCH LANGUAGE	FRE	0(DISABLE)/1(ENABLE)	1	FIX	
RUSSIAN LANGUAGE	RUS	0(DISABLE)/1(ENABLE)	1	FIX	
FORCED V-SYNC SLICING LEVEL	FSL	0(DISABLE)/1(ENABLE)	0	FIX	
SYNC OF OSD	HP2	0(DISABLE)/1(ENABLE)	0	FIX	
TUNER SELECTION (0:SHARP/ALPS;1:MURATA)	CPT	0(DISABLE)/1(ENABLE)	0	FIX	
BILINGUAL	BIL	0(DISABLE)/1(ENABLE)	0	FIX	
IF AGC SPEED BIT 0	AGC0	0(DISABLE)/1(ENABLE)	1	FIX	
IF AGC SPEED BIT 1	AGC1	0(DISABLE)/1(ENABLE)	0	FIX	
PHI-1 TIME CONSTANT (RF)	FOA-FE	0(DISABLE)/1(ENABLE)	0	FIX	
PHI-1 TIME CONSTANT (RF)	FOB-FE	0(DISABLE)/1(ENABLE)	0	FIX	
PHI-1 TIME CONSTANT (OFF AIR)	FOA-AV	0(DISABLE)/1(ENABLE)	1	FIX	
PHI-1 TIME CONSTANT (OFF AIR)	FOB-AV	0(DISABLE)/1(ENABLE)	1	FIX	

Note :

Fixed data, please do not change without specific instruction.

\*1: White point RED and GREEN COOL WHITE TEMP for 18000 degree colour TEMP (SMEF MODELS) MINUS 5. other models (123K degree colour temp) still same MINUS 7.

\*2: CDL initial data=2 for all 20" & 21" only.

# INITIAL SETTING

(1) In service mode, After execute select POS 1, store the following tuning data in E²PROM.

MCL1			MCL2		
CH-No.	Fv (MHz)	SOUND SYS	CH-No.	Fv (MHz)	SOUND SYS
0			0	590.25	B/G
1	48.25	B/G	1	46.25	B/G
2	62.25	B/G	2	64.25	B/G
3	77.25	D/K	3	86.25	B/G
4	175.25	B/G	4	95.25	B/G
5	182.25	B/G	5	138.25	B/G
6	183.25	D/K	6	175.25	B/G
7	191.25	D/K	7	182.25	B/G
8	196.25	B/G	8	189.25	B/G
9	199.25	M	9	196.25	B/G
10	210.25	B/G	10	209.25	B/G
11	224.25	B/G	11	216.25	B/G
12	471.25	B/G	12		
13	487.25	I	13		
14	503.25	B/G	14		
15	575.25	B/G	15		
16	583.25	B/G	16		
17	599.25	B/G	17		
18	621.25	M	18	527.25	B/G
19	639.25	D/K	19	847.25	B/G
20	703.25	B/G	20	48.25	B/G
21	735.25	I	21	175.25	B/G
22	767.25	B/G	22	210.25	B/G
23	815.25	B/G	23	224.25	B/G
24	855.25	I	24	575.25	B/G
25	855.25	B/G	25	599.25	B/G
26	55.25	M	26	767.25	B/G
27	83.25	M	27	183.25	M
28	183.25	M	28	193.25	M
29	193.25	M	29	112.25	B/G
30	217.25	M	30	168.25	B/G
31	471.25	M	31		
32	477.25	M	32	294.25	B/G
33	693.25	M	33	463.25	B/G
34			34	174.95	B/G
35	112.25	B/G	35	175.55	B/G
36	168.25	B/G	36		
37			37	599.25	B/G
38	294.25	B/G	38		
39	463.25	B/G	39		
40			40		
41	647.25	B/G	41		
42	663.25	B/G	42		
43	679.25	B/G	43		
44	174.95	B/G			
45	175.55	B/G			

# SHIPPING SETTING & CHECKING

(1) The following default data has been factory-set for the E²PROM.

ITEMS	DATA SETTING
LAST PROGRAM/CHANNEL	1
FLASHBACK PROGRAM/CH	1
DIGIT	1
C-SYSTEM	AUTO
S-SYSTEM	*1
SKIP	OFF
AFC	ON
VOLUME	1
CONTRAST	60 (MAX)
COLOUR	0 (CENTER)
BRIGHTNESS	0 (CENTER)
TINT	0 (CENTER)
SHARPNESS	0 (CENTER)
WHITE TEMP	STANDARD
REMINDER TIMER	In-active, "----"
ON TIMER	In-active, "----"
OFF TIMER	In-active, "----"
LAST POWER	POWER-ON
LANGUAGE	*1
BLUE BACKMUTE	OFF
HOTEL MODE	OFF
0 CHANNEL SKIP	ON

\*1: Please refer defaults for LANGUAGE and SOUND SYSTEM per MODEL as follows,

MODEL	LANGUAGE	SOUND SYSTEM
3	ENGLISH	B/G
4	ARABIC	B/G

## FACTORY SETTINGS BY MODELS (Reference: Geomagnetism Adjustment)

MODEL	Magnetic filed (V/H) nT	Background	Lang.	S-SYS
F	-10,000 40,000	12,300°K	ENGLISH	B/G
G	30,000 20,000	18,000°K	ARABIC	B/G
*G (Africa)	-10,000 40,000	12,300°K	ENGLISH	B/G
Y	10,000 40,000	12,300°K	ENGLISH	B/G

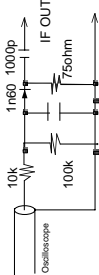
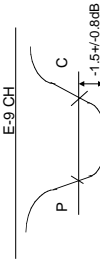
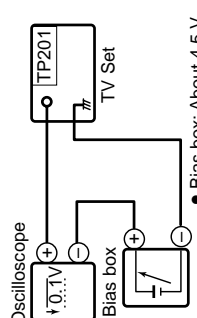
\*Note for OSD type

\*OSD Lang. must be set in service mode, but it's better to write in E²PROM.

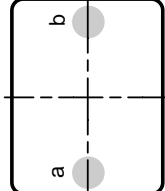
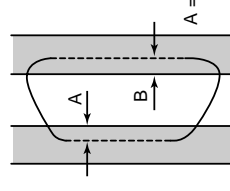
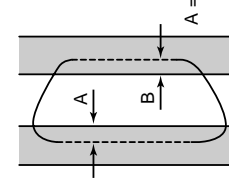
Language quantities are 6 as below:

English/Chinese/French/Arabic/Malay/Russian

## PIF ADJUSTMENT

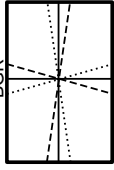
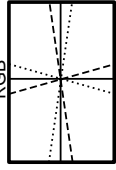
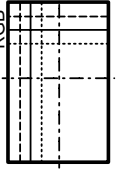
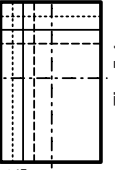
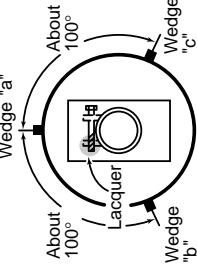
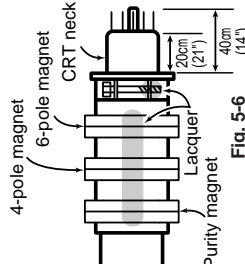
NO.	Adjustment part	Adjusting procedure and conditions	Waveform and others
1	TUNER IFT (PRESET)	<ol style="list-style-type: none"> <li>Get the tuner ready to receive the E-9 CH signal, but with no signal input. Adjust the PLL data.</li> <li>Connect the sweep generator's output cable to the tuner antenna. (RF SWEEP)</li> <li>Adjust the sweep generator's to 80dBμV.</li> <li>Connect the response lead (use LOW IMPEDANCE probe with wave detector; see Fig.1) to the tuner's IF output terminal. (This terminal must have the probe alone connected).</li> <li>Set the RF AGC to 0 - 6 V with no saturation with the waveform.</li> <li>Adjust the tuner IF coil to obtain the waveform as shown in Fig. 2.</li> </ol> <p><b>Note:</b> Be sure to keep the tuner cover in position during this adjustment.</p>	 <p><b>Fig. 1</b></p>  <p><b>Fig. 2</b></p>
2	RF-AGC TAKE OVER POINT ADJUSTMENT (I <sup>2</sup> C BUS CONTROL)	<ol style="list-style-type: none"> <li>Receive "PAL COLOUR BAR" signal. • Signal Strength: 57 ±1 dBμV (75 ohm open)</li> <li>Connect the oscilloscope to TP201 (Tuner's AGC Terminal) as shown in Fig. 3.</li> <li>Call "AGC" mode in service mode. Adjust the "AGC" bus data to obtain the Tuner output pin drop 0.1 V below maximum voltage.</li> <li>Change the antenna input signal to 63-67dBμV, and make sure there is no noise.</li> <li>Turn up the input signal to 90-95 dBμV to be sure that there is no cross modulation beat.</li> </ol>	 <p><b>Fig. 3</b></p> <p>• Bias box: About 4.5 V</p>

## PURITY ADJUSTMENT

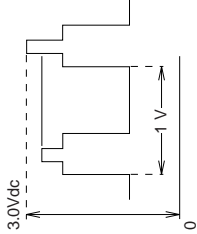
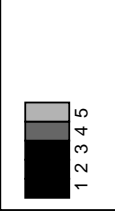
NO.	Adjustment part	Adjusting procedure and conditions	Waveform and others
1	PURITY ADJUSTMENT	<ol style="list-style-type: none"> <li>Receive the GREEN-ONLY signal. Adjust the beam current to ~700 μA (21" &amp; 20")/-500 μA (14").</li> <li>Degauss the CRT enough with the degaussing coil. Note: Follow the Job Instruction Sheet to adjust the magnetic field. <b>Vertical Bv : +0.030 mT (0.30 gauss)</b> <b>Horizontal Bh : +0.020 mT (0.20 gauss)</b> (Reference: page 8/21)</li> <li>Maintain the purity magnet at the zero magnetic field and keep the static convergence roughly adjusted.</li> <li>Observe the points a, b as shown in Fig. 4-1 through the microscope. Adjust the landings to the rank A requirements.</li> <li>Orient the raster rotation to 0 eastward.</li> <li>Tighten up the deflection coil screws. • Tightening torque: 108 ± 20 N (11 ± 2 kgf)</li> <li>Make sure the CRT corners landing meet the A rank requirements. If not, stick the magnet sheet to correct it.</li> </ol> <p><b>Note:</b> This adjustment must be done after warming up the unit for 30 minutes or longer with a beam current over 700 μA. (21" &amp; 20") (For 14", the beam current should be over 500 μA).</p> <p><b>Note:</b> Set the service mode by JA122 &amp; JA124 (short) then press factory process R/C RGB key to change to RGB mono colour mode.</p> <p>* For the following colours press R/C RGB key to change.</p>	 <p><b>Fig. 4-1</b></p>  <p><b>Fig. 4-2</b> Rank "A" (on the right of the CRT)</p>  <p><b>Fig. 4-3</b> Rank "A" (on the left of the CRT)</p> <p>* Press R/C RGB key for 1 second in NORMAL MODE, the colour will change to RGB mono colour mode.</p> <p>Text Key "R.G.Cy" Key can be directly use to change to other colours screen.</p>



## CONVERGENCE ADJUSTMENT

NO.	Adjustment part	Adjusting procedure and conditions	Waveform and others
1	<b>CONVERGENCE ADJUSTMENT</b> (To be done after the purity adjustment.)	<p>1. Receive the "Crosshatch Pattern" signal.</p> <p>2. Using the remote controller, call NORMAL mode.</p> <p><b>Static convergence</b></p> <p>1. Turn the 4-pole magnet to a proper opening angle in order to superpose the blue and red colours.</p> <p>2. Turn the 6-pole magnet to a proper opening angle in order to superpose the green colour over the blue and red colours.</p> <p><b>Dynamic convergence</b></p> <p>1. Adjust the convergence on the fringes of the screen in the following steps.</p> <p>a) Fig. 5-1: Drive the wedge at point "a" and swing the deflection coil upward.</p> <p>b) Fig. 5-2: Drive the wedge at points "b" and "c" and swing the deflection coil downward.</p> <p>c) Fig. 5-3: Drive the "c" wedge deeper and swing the deflection coil rightward.</p> <p>d) Fig. 5-4: Drive the "b" wedge deeper and swing the deflection coil leftward.</p> <p>2. Fix all the wedges on the CRT and apply glass tape over them.</p> <p>3. Apply lacquer to the deflection yoke lock screw, magnet unit (purity, 4-pole, 6-pole magnets) and magnet unit lock screw.</p> <p>Finally received the Red-only and Blue-only signals to make sure there is no other colours on the screen.</p>	     

## CRT CUT-OFF, BACKGROUND AND SUB-CONTRAST ADJUSTMENT

NO.	Adjustment part	Adjusting procedure and conditions	Waveform and others
1	<b>CRT CUTOFF ADJUSTMENT</b> (I <sup>FC</sup> BUS CONTROL)	<p>1. Switch TV to VIDEO mode, BLUE BACK OFF, with NO VIDEO signal.</p> <p>2. Press R/C to set Picture Normal condition.</p> <p>3. Connect the oscilloscope to Red OUT from IC801, (TP851 (14"/TP852 (20"/21")))</p> <p>Range : 1 V/Div (DC) Sweep : 5 msec/Div</p> <p>4. Adjust SCREEN VR, so that the tip of signal reach 3.0±0.1 Vdc.</p>	 <p>Fig. 6</p>
2	<b>SUB-BRIGHTNESS ADJUSTMENT</b> (I <sup>FC</sup> BUS CONTROL)	<p>1. Call "SUB-BRI" in service mode. (Receive Crosshatch pattern with 5 black level windows)</p> <p>2. Adjust the "SUB BRIGHT" bus data in order that the line 1, 2 and 3 have the same darkness whereas line 4 is slightly brighter than line 1, 2 and 3 and finally line 5 will be the brighter than line 4.</p>	 <p>Fig. 7</p> <p>1, 2 and 3 are in same black level.</p>
3	<b>WHITE BALANCE SERVICE MODE ADJUSTMENT</b> (I <sup>FC</sup> BUS CONTROL)	<p>1. Receive the "WHITE" pattern with BURST signal.</p> <p>2. Press R/C to set Picture NORMAL condition.</p> <p>3. Connect the DC milliammeter between TP602 (-) and TP603 (+).</p> <p>4. Check Beam current should be around 1,100 µA (20" &amp; 21") (14" around 800 µA).</p> <p>5. Set it to service mode and adjust the DRI-GS, &amp; DRI-BS data to have a colour temperature of 12,300°K or 7,500°K (white).</p> <p>* Note .</p> <p>6. Receive "WHITE" pattern, WITH BURST signal, and set BRIGHTNESS Y by generator, to ** 10 cd/m2 (MINOLTA CA-100) by reducing LUMINATE Y signal.</p> <p>7. Adjust "CUT-R" &amp; "CUT-G" to get desired colour temperature. Then go back NORMAL mode (HIGH BRIGHT*) to check colour temperature. If out 14" back to (1)</p> <p><b>Note: This adjustment must be done after warming up the unit for 30 minutes or longer with a beam current over 700 µA. (20" &amp; 21")</b></p> <p>(For 14", the beam current should be over 500 µA)</p> <p>* Adjust DRI-GC/GW, DR-BC/BW as following data, after finishing DRI-BS and DRI-GS data adjustment.</p> <p>DRI-RW=32 (FIXED), DRI-GW="DRI-GS"-7*, DRI-BW="DRI-BS"-7*</p> <p>DRI-RC=25, DRI-BC="DRI-BS", DRI-GC="DRI-GS"-7*</p>	<p>Refer to Page ????</p> <p>* 12,300°K X : 0.272 Y : 0.275</p> <p>* 18,000°K X : 0.255 Y : 0.255</p> <p>(MINOLTA COLOUR ANALYZER CA-100)</p> <p><b>*Note: Above Data can be UP/DOWN by Volume key.</b></p> <p>LOW HIGH 14" 10 cd/m2 200 cd/m2 20"/21" 10 cd/m2 120 cd/m2</p> <p>* 12,300°K DRI-GW="DRI-GS"-7 DRI-BW="DRI-BS"-7</p> <p>* 18,000°K DRI-GC="DRI-GS" DATA-5 DRI-RC=27</p>
4	<b>MAXIMUM BEAM CHECK</b>	<p>1. Receive the "Monoscope Pattern" signal.</p> <p>2. Press R/C to set Picture NORMAL condition.</p> <p>3. Connect the DC milliammeter between TP603 (+) and TP602 (-).</p> <p>(Full Scale: 3 mA Range)</p> <p>4. Beam current must be within 1,100 ±100µA (21") 800 ±100 µA(14") .</p>	

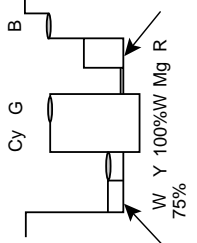


## HORIZONTAL, VERTICAL, DEFLECTION LOOP AND FOCUS ADJUSTMENT

NO.	Adjustment part	Adjusting procedure and conditions	Waveform and others
1	<b>V-SLOPE</b> (I <sup>2</sup> C BUS CONTROL)	<ol style="list-style-type: none"> <li>1. Receive Monoscope Pattern Signal.</li> <li>2. Call the "V-LIN" mode.</li> <li>3. Increase or decrease "V-LIN" by Volume key till the horizontal line in the center of monoscope is just at the position where the blanking starts.</li> </ol>	
2	<b>V-SHIFT-50</b> (I <sup>2</sup> C BUS CONTROL)	<ol style="list-style-type: none"> <li>1. Call the "V-CENT" mode.</li> <li>2. Increase or decrease "V-CENT" by Volume key till the picture is centered.</li> </ol>	
3	<b>V-AMP 50</b> (I <sup>2</sup> C BUS CONTROL)	<ol style="list-style-type: none"> <li>1. Call the "V-AMP" mode.</li> <li>2. Increase or decrease "V- AMP" by Volume key to set overscan of 9.5% typical. Adjustment Spec 9.5% range +1% -0%.</li> </ol>	
4	<b>S-CORRECTION</b> (I <sup>2</sup> C BUS CONTROL)	<b>FIXED DATA, NO NEED TO ADJUST.</b>	
5	<b>H-SHIFT (50)</b> (H-CENTER) (I <sup>2</sup> C BUS CONTROL)	<ol style="list-style-type: none"> <li>1. Call the "H-CENT" mode.</li> <li>2. Increase or decrease "H-CENT" by Volume key to center the picture horizontal.</li> </ol>	
1	<b>FOCUS ADJUSTMENT</b>	<ol style="list-style-type: none"> <li>1. Receive the "Monoscope Pattern" signal.</li> <li>2. Press R/C to set Picture NORMAL condition.</li> <li>3. Adjust the focus control to get the best focusing.</li> </ol>	

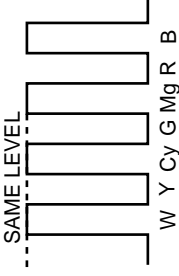
9

## PAL CHROMA ADJUSTMENT

NO.	Adjustment part	Adjusting procedure and conditions	Waveform and others
1	<b>SUB COLOUR</b> (I <sup>2</sup> C BUS CONTROL)	<ol style="list-style-type: none"> <li>1. Receive the "PAL Colour Bar" signal.</li> <li>2. Press R/C to set Picture Normal condition.</li> <li>3. Connect the oscilloscope to Red cathode. <ul style="list-style-type: none"> <li>● Range : 20 V/Div. (AC) (Use 10:1 probe)</li> <li>● Sweep time : 10 μsec/Div.</li> </ul> </li> <li>4. Using the R/C call "SUB COL" in SERVICE mode. Adjust SUB COLOUR bus data, so that the 75% White &amp; Red portions of PAL Colour Bar be at the same level shown as Fig. 8.</li> <li>5. Clear the SERVICE mode.</li> </ol>	 <p>Fig. 8</p>

9-1

## NTSC CHROMA ADJUSTMENT

NO.	Adjustment part	Adjusting procedure and conditions	Waveform and others
1	<b>SUB-TINT</b> (I <sup>2</sup> C BUS CONTROL)	<ol style="list-style-type: none"> <li>1. Receive the "NTSC 3.58 Colour Bar" signal thru AV in.</li> <li>2. Connect the oscilloscope to TP853 (Pin (5) of P882) BLUE-OUT. <ul style="list-style-type: none"> <li>● Range : 100 mV/Div. (AC)</li> <li>(Use Probe 10:1)</li> <li>● Sweep time : 10 μsec/Div.</li> </ul> </li> <li>3. Call the "SUB-TINT" mode in service mode. Adjust the "SUB-TINT" bus data to obtain the waveform shown as Fig. 9.</li> <li>4. Clear the SERVICE mode.</li> </ol>	 <p>Fig. 9</p>

## PROTECTOR OPERATION CHECKING

NO.	Adjustment part	Adjusting procedure and conditions	Waveform and others
1	<b>BEAM PROTECTOR</b>	<ol style="list-style-type: none"> <li>1. Receive "Monoscope Pattern" signal.</li> <li>2. Set CONTRAST MAX.</li> <li>3. Set BRIGHT MAX.</li> <li>4. During the Collector &amp; Emitter of Q883/5/7 short, make sure the protector ON and switch to standby mode.</li> </ol>	* Select one of Q883/5/7 to do each short test.
2	<b>H, V PROTECTOR</b>	<ol style="list-style-type: none"> <li>1. Receive "Monoscope Pattern" signal.</li> <li>2. Connect output of Bias Box to D607 cathode (R606 side).</li> <li>3. Set voltage of Bias Box to 18V and make sure the protector is not work.</li> <li>4. Set voltage of Bias Box to 27V, and make sure the protector is work.</li> </ol>	
3	<b>OTHER PROTECTOR</b>	<ol style="list-style-type: none"> <li>1. Once finish rectified Electrolytic Capacitor short testing in +B line, check all possible damaged components on +B line. (Use random selected set for inspection)</li> </ol>	

## AV INPUT AND OUTPUT CHECKING

NO.	Adjustment part	Adjusting procedure and conditions	Waveform and others
1	<b>VIDEO AND AUDIO OUTPUT CHECK</b>	<ol style="list-style-type: none"> <li>1. Receive the "PAL Colour Bar" signal (100% White Color Bar, Sound 400 Hz 100% Mod C475.)</li> <li>2. Terminate the Video output with a 75 ohm impedance. Make sure the output is as specified (1.0 Vp-p ±3 dB).</li> <li>3. Terminate the Audio output with a 10K ohm impedance. Make sure the output is as specified (1.76 Vp-p ±3 dB).</li> </ol>	
2	<b>VIDEO AND AUDIO INPUT CHECK</b>	<ol style="list-style-type: none"> <li>1. Using the TV/AV key on the remote controller, make sure that the modes change in order of TV, AV1, AV2 &amp; TV again and the video &amp; audio output are according to the input terminal for each mode.</li> </ol>	

9-2

14BM2, 14BM2S/G  
20BM2, 20BM2S/G  
21BM2, 21BM2S/G

## FUNCTION OPERATION CHECKING (VIDEO AND AUDIO)

NO.	Adjustment part	Adjusting procedure and conditions	Waveform and others
1	<b>CONTRAST KEY</b>	1. Receive "Monoscope Pattern" signal. 2. Set P-Mode to select CONTRAST. 3. Press Volume Up/Down key to check whether the CONTRAST effect is OK or not.	
2	<b>COLOUR KEY</b>	1. Receive "Colour Bar" signal. 2. Set P-Mode to select COLOUR. 3. Press Volume Up/Down key to check whether the COLOUR effect is OK or not.	
3	<b>BRIGHTNESS KEY</b>	1. Receive "Monoscope Pattern" signal. 2. Set P-Mode to select BRIGHTNESS. 3. Press Volume Up/Down key to check whether the BRIGHTNESS effect is OK or not.	
4	<b>TINT KEY</b>	1. Receive the "NTSC Colour Bar" signal thru AV In. 2. Set P-Mode to select TINT. 3. Press Volume Up/Down key to check TINT, UP for GREEN direction and DOWN for PURPLE direction whether is OK or not.	
5	<b>SHARPNESS KEY</b>	1. Receive "Monoscope Pattern" signal. 2. Set P-mode to select SHARPNESS. 3. Press Volume Up/Down key to check whether the SHARPNESS effect is OK or not.	
6	<b>CH DISPLAY COLOUR</b>	1. All Ch (1~99) will have an OSD display of the channel number in green colour under AFT ON condition.	
7	<b>NORMAL KEY</b>	1. Once in PICTURE Mode, and the NORMAL key is pressed, all the settings will be present to normal setting. (Normal setting value for every mode). ● CONTRAST : MAX ● COLOUR : CENTER ● BRIGHTNESS : CENTER ● TINT : CENTER ● SHARPNESS : CENTER	<b>Note:if nothing is display mean contrast, colour, bright, tint or sharpness are all in normal setting.</b>
8	<b>WHITE TEMP</b>	1. Receive "Monoscope Pattern" signal. 2. Set FUNCTION to select WHITE TEMP. 3. Press Volume Up/Down key to check WHITE TEMP Option. STANDARD: NORMAL SETTING, WARM for more RED-DISH direction changing, COOL for more BLUISH direction changing.	

## FUNCTION OPERATION CHECKING (VIDEO AND AUDIO) (Continued)

NO.	Adjustment part	Adjusting procedure and conditions	Waveform and others
9	<b>COLOUR SYSTEM</b>	1. Receive the "PAL COLOUR BAR" signal, press the COLOUR SYSTEM key to select modes except PAL, check the COLOUR is not working properly. Then, select the "PAL" mode. Check again its colour so that it is working properly. 2. Receive "SECAM COLOUR BAR" signal, press COLOUR SYSTEM key to select modes except SECAM, check the COLOUR is not working properly. Then, select the "SECAM" mode. Check again its colour so that it is working properly. 3. Receive "NTSC 4.43/3.58 COLOUR BAR" signal thru AV, press COLOUR SYSTEM key to select modes except N4.43/3.58, check the COLOUR is not working properly. Then, select the "NTSC 4.43/3.58" mode. Check again its colour so that it is working properly.	
10	<b>SOUND SYSTEM</b>	1. Receive "PAL-D/K" signal, press the "SOUND SYSTEM" turn to B/G, I. Check the sound output is not working properly. Select D/K and check the sound output to make sure it is working properly. 2. Receive "PAL-I" signal, press the "SOUND SYSTEM" to select B/G, D/K. Check the sound output is not working properly. Select I and check the sound output to make sure it is working properly. 3. Receive "PAL-B/G" signal, press the "SOUND SYSTEM" to select I, D/K. Check the sound output is not working properly. Select B/G and check the sound output to make sure it is working properly.	
11	<b>NOISE MUTE CHECKING</b>	1. Receive "PAL COLOUR BAR" signal. 2. Turn up the volume control to maximum, make sure the sound is heard from the speakers. Then put the unit in no signal state. 3. Check the sound mute is effective. 4. Finally turn sound level of CTV to minimum.	
12	<b>OSD LANGUAGE QUANTITY CHECK</b>	There are six language as below: English, Russian, Chinese, French, Arabic and Malay.	

# MEMORY MAP

[illegible]

ADDRESS (HEX)	D7	D6	D5	D4	D3	D2	D1	D0	MC0N	EEPROM RANGE	EEPROM WRITE(CPU)	CHASSIS	CPU FINAL CHECK DATA	LAST INTAL SETTING DATA	REMARK
40									D4	00-0F					
41									0C	00-0F					
42									08	00-0F					
43															
44	FC0	ACL	QSD	ENT	EVC	FR		BKS		00-FF					
45	SCM	NA43	NS08	PR-SEC	BS	I	DA	M		00-FF					
46															
47	MP2	FIL	RUS	FA	CH	MLV	THA			00-FF					
48										00-FF					
49															
4A															
4B															
4C									01	00-3C					
4D									3C	00-3C					
4E									1E	00-3C					
4F									1E	00-3C					
50									1E	00-3C					
51									1E	00-3C					
52															
53															
54															
55									01	00-FF					
56									0A	00-FF					
57									14	00-FF					
58									1E	00-FF					
59									28	00-FF					
5A															
5B															
5C									00	00-01					
5D									00	00-02					
5E									00	00-01					
5F									00	00-07					
60									00	00-01					
61															
62	SKP 0	SKP 1	SKP 2	SKP 3	SKP 4	SKP 5	SKP 6	SKP 7	80	00-FF					
63	SKP 8	SKP 9	SKP 10	SKP 11	SKP 12	SKP 13	SKP 14	SKP 15	00	00-FF					
64	SKP 16	SKP 17	SKP 18	SKP 19	SKP 20	SKP 21	SKP 22	SKP 23	00	00-FF					
65	SKP 24	SKP 25	SKP 26	SKP 27	SKP 28	SKP 29	SKP 30	SKP 31	00	00-FF					
66	SKP 32	SKP 33	SKP 34	SKP 35	SKP 36	SKP 37	SKP 38	SKP 39	00	00-FF					
67	SKP 40	SKP 41	SKP 42	SKP 43	SKP 44	SKP 45	SKP 46	SKP 47	00	00-FF					
68	SKP 48	SKP 49	SKP 50	SKP 51	SKP 52	SKP 53	SKP 54	SKP 55	00	00-FF					
69	SKP 56	SKP 57	SKP 58	SKP 59	SKP 60	SKP 61	SKP 62	SKP 63	00	00-FF					
6A	SKP 64	SKP 65	SKP 66	SKP 67	SKP 68	SKP 69	SKP 70	SKP 71	00	00-FF					
6B	SKP 72	SKP 73	SKP 74	SKP 75	SKP 76	SKP 77	SKP 78	SKP 79	00	00-FF					

ADDRESS (HEX)	DATA								MICON DEFAULT	EPCRON RANGE	EPCRON WRITE(0)	CHASSIS HEX(OAT)	CHECK TYPE	CITY FINAL	L48 INT'L SETTING DATA	REMARK			
	D7	D6	D5	D4	D3	D2	D1	D0											
80																			
81																			
82			S-SYS			AFT	(640)												
83																			
84																POS 1			
85			S-SYS			AFT	(640)												
86																POS 6			
87																			
88			S-SYS			AFT	(640)									POS 7			
89																			
8A																			
8B			S-SYS			AFT	(640)									POS 8			
8C																			
8D			S-SYS			AFT	(640)									POS 9			
8E																			
8F																			
90			S-SYS			AFT	(640)									POS 10			
91																			
92																			
93																			
94			S-SYS			AFT	(640)									POS 11			
95																			
96																			
97			S-SYS			AFT	(640)									POS 12			
98																			
99																			
9A			S-SYS			AFT	(640)									POS 13			
9B																			
9C																			
9D			S-SYS			AFT	(640)									POS 14			
9E																			
9F																			
A0			S-SYS			AFT	(640)									POS 15			
A1																			
A2																			
A3			S-SYS			AFT	(640)									POS 16			
A4																			
A5																			
A6			S-SYS			AFT	(640)									POS 17			
A7																			
A8																			
A9			S-SYS			AFT	(640)									POS 18			
AA																			
AB																			
AC			S-SYS			AFT	(640)									POS 19			
AD																			
AE																			
AF			S-SYS			AFT	(640)									POS 20			
B0																			
B1			S-SYS			AFT	(640)									POS 21			
B2																			
B3																			
B4																			
B5			S-SYS			AFT	(640)									POS 22			
B6																			
B7																			
B8			S-SYS			AFT	(640)									POS 23			
B9																			
BA																			
BB			S-SYS			AFT	(640)									POS 24			
BC																			
BD																			
BE			S-SYS			AFT	(640)									POS 25			
BF																			
MODEL		MODEL								MODEL								LETTER NO	

ADDRESS (HEX)	DATA							MCON DEFAULT	EPRCON RANGE	EPRCON WRITE/UPDATE	CHASSIS CHECK DATA SHEET TYPE	CITY/FINAL CHECK DATA SHEET TYPE	LAST INITIAL SETTING DATA	REMARKS
	D7	D6	D5	D4	D3	D2	D1							
C0					TUNING FREQUENCY (LOWER PART)	AFT	(max)							POS 25
C1		S-SYS												
C2					TUNING FREQUENCY (HIGHER PART)	AFT	(max)							POS 26
C3					TUNING FREQUENCY (LOWER PART)	AFT	(max)							
C4		S-SYS												
C5					TUNING FREQUENCY (HIGHER PART)	AFT	(max)							POS 27
C6					TUNING FREQUENCY (LOWER PART)	AFT	(max)							
C7		S-SYS												
C8					TUNING FREQUENCY (HIGHER PART)	AFT	(max)							POS 28
C9					TUNING FREQUENCY (LOWER PART)	AFT	(max)							
CA		S-SYS												
CB					TUNING FREQUENCY (HIGHER PART)	AFT	(max)							POS 29
CC					TUNING FREQUENCY (LOWER PART)	AFT	(max)							
CD		S-SYS												
CE					TUNING FREQUENCY (HIGHER PART)	AFT	(max)							POS 30
CF					TUNING FREQUENCY (LOWER PART)	AFT	(max)							
D0		S-SYS												
D1					TUNING FREQUENCY (HIGHER PART)	AFT	(max)							POS 31
D2					TUNING FREQUENCY (LOWER PART)	AFT	(max)							
D3		S-SYS												POS 32
D4					TUNING FREQUENCY (HIGHER PART)	AFT	(max)							
D5					TUNING FREQUENCY (LOWER PART)	AFT	(max)							POS 33
D6		S-SYS												
D7					TUNING FREQUENCY (HIGHER PART)	AFT	(max)							POS 34
D8					TUNING FREQUENCY (LOWER PART)	AFT	(max)							
D9		S-SYS												POS 35
DA					TUNING FREQUENCY (HIGHER PART)	AFT	(max)							
DB					TUNING FREQUENCY (LOWER PART)	AFT	(max)							POS 36
DC		S-SYS												
DD					TUNING FREQUENCY (HIGHER PART)	AFT	(max)							POS 36
DE					TUNING FREQUENCY (LOWER PART)	AFT	(max)							
DF		S-SYS												POS 36
E0					TUNING FREQUENCY (HIGHER PART)	AFT	(max)							
E1					TUNING FREQUENCY (LOWER PART)	AFT	(max)							POS 37
E2		S-SYS												
E3					TUNING FREQUENCY (HIGHER PART)	AFT	(max)							POS 37
E4					TUNING FREQUENCY (LOWER PART)	AFT	(max)							
E5		S-SYS												POS 38
E6					TUNING FREQUENCY (HIGHER PART)	AFT	(max)							
E7					TUNING FREQUENCY (LOWER PART)	AFT	(max)							
E8		S-SYS												POS 39
E9					TUNING FREQUENCY (HIGHER PART)	AFT	(max)							
EA					TUNING FREQUENCY (LOWER PART)	AFT	(max)							
EB		S-SYS												POS 40
EC					TUNING FREQUENCY (HIGHER PART)	AFT	(max)							
ED					TUNING FREQUENCY (LOWER PART)	AFT	(max)							
EE		S-SYS												POS 41
EF					TUNING FREQUENCY (HIGHER PART)	AFT	(max)							
F0					TUNING FREQUENCY (LOWER PART)	AFT	(max)							POS 42
F1		S-SYS												
F2					TUNING FREQUENCY (HIGHER PART)	AFT	(max)							POS 43
F3					TUNING FREQUENCY (LOWER PART)	AFT	(max)							
F4		S-SYS												POS 43
F5					TUNING FREQUENCY (HIGHER PART)	AFT	(max)							
F6					TUNING FREQUENCY (LOWER PART)	AFT	(max)							POS 44
F7		S-SYS												
F8					TUNING FREQUENCY (HIGHER PART)	AFT	(max)							POS 44
F9					TUNING FREQUENCY (LOWER PART)	AFT	(max)							
FA		S-SYS												POS 45
FB					TUNING FREQUENCY (HIGHER PART)	AFT	(max)							
FC					TUNING FREQUENCY (LOWER PART)	AFT	(max)							POS 46
FD		S-SYS												
FE														
FF														
MODEL														
MODEL														
LETTER NO														
LETTER NO														

13-1

LETTER NO.

ADDRESS (HEX)	DATA										MCOIN DEFAULT	EEPROM RANGE	EEPROM WRITE(20)	CHASSIS CHECK DATA	CITY FINAL CHECK TYPE	LAST INITIAL SETTING DATA	REMARK
	D7	D6	D5	D4	D3	D2	D1	D0									
181																	PCS 88
182																	PCS 89
183																	PCS 90
184																	PCS 91
185																	PCS 92
186																	PCS 93
187																	PCS 94
188																	PCS 95
189																	PCS 96
190																	PCS 97
191																	PCS 98
192																	PCS 99
193																	PCS 9A
194																	PCS 9B
195																	PCS 9C
196																	PCS 9D
197																	PCS 9E
198																	PCS 9F
199																	PCS 9G
19A																	PCS 9H
19B																	PCS 9I
19C																	PCS 9J
19D																	PCS 9K
19E																	PCS 9L
19F																	PCS 9M
1A0																	PCS 9N
1A1																	PCS 9O
1A2																	PCS 9P
1A3																	PCS 9Q
1A4																	PCS 9R
1A5																	PCS 9S
1A6																	PCS 9T
1A7																	PCS 9U
1A8																	PCS 9V
1A9																	PCS 9W
1AA																	PCS 9X
1AB																	PCS 9Y
1AC																	PCS 9Z
1AD																	PCS 9A
1AE																	PCS 9B
1AF																	PCS 9C
1B0																	PCS 9D
1B1																	PCS 9E
1B2																	PCS 9F
1B3																	PCS 9G
1B4																	PCS 9H
1B5																	PCS 9I
1B6																	PCS 9J
1B7																	PCS 9K
1B8																	PCS 9L
1B9																	PCS 9M
1BA																	PCS 9N
1BB																	PCS 9O
1BC																	PCS 9P
1BD																	PCS 9Q
1BE																	PCS 9R
1BF																	PCS 9S
MODEL																	MODEL
LETTER NO.																	LETTER NO.



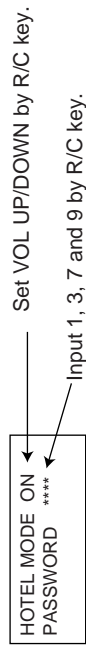
## UA1 HOTEL MODE APPLICATION NOTE

The purpose of this HOTEL MODE is to enable hotel authorized person to store the tuned programs as hotel channels, current volume as hotel volume (maximum volume), picture and sound setting. In addition, The user will not be able to select Preset and Channel-setting functions.

How to enable/disable the "Hotel Mode" ?

Ans: a) Select BLUE BACK function (under MENU-FEATURE selection) by R/C, press the -/— (one/two digit) key and keep pressing it for five second, then you can see the hotel mode with four digits password.

b) Key in the four digits password starting with number "1", "3", "7", "9", then the hotel mode will be ENABLE condition, you can switch on/off the hotel mode by using R/C (volume up/down) key.



\* We recommend:

Before set the hotel mode, it is better to choose CH 1 & set SOUND VOLUME level Up to 75% full scale.

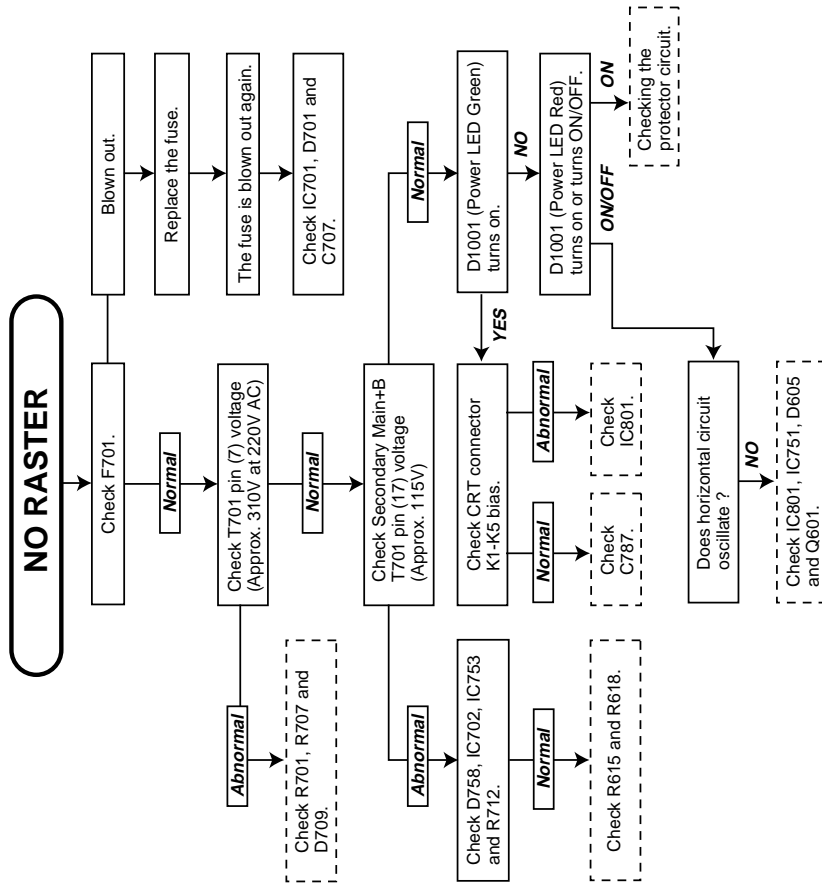
After set hotel mode, starting channel will be always ch 1 & maximum sound level out will be set to 75% of full scale.

\* If you set hotel mode in AV, starting channel will be the last ch which you received before power off (same as normal operation).

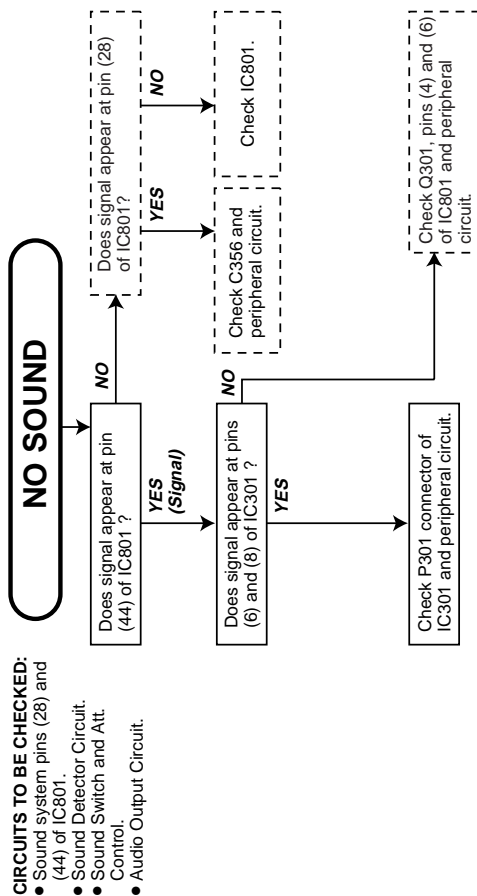
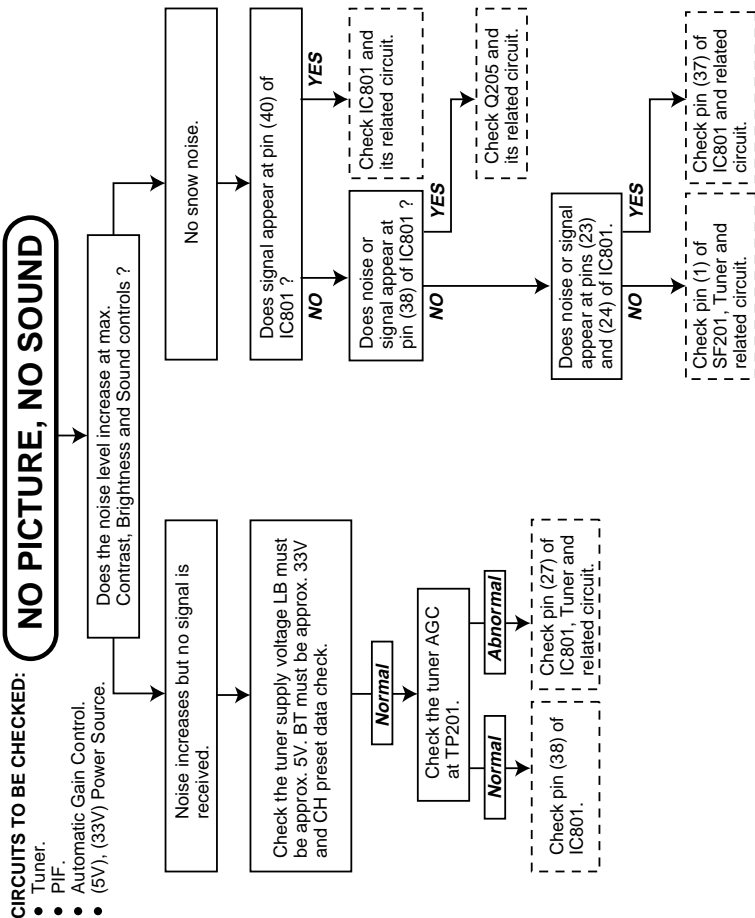
## CONDITION:

When using hotel mode, the user can ONLY control PICTURE, SOUND and FEATURE selection. But, it will return to the previous hotel mode setting condition, after power off. The user can't use: — CH-SETTING (OSD become violet) and Preset. Other functions is allowed to be used.

## TROUBLE SHOOTING TABLE

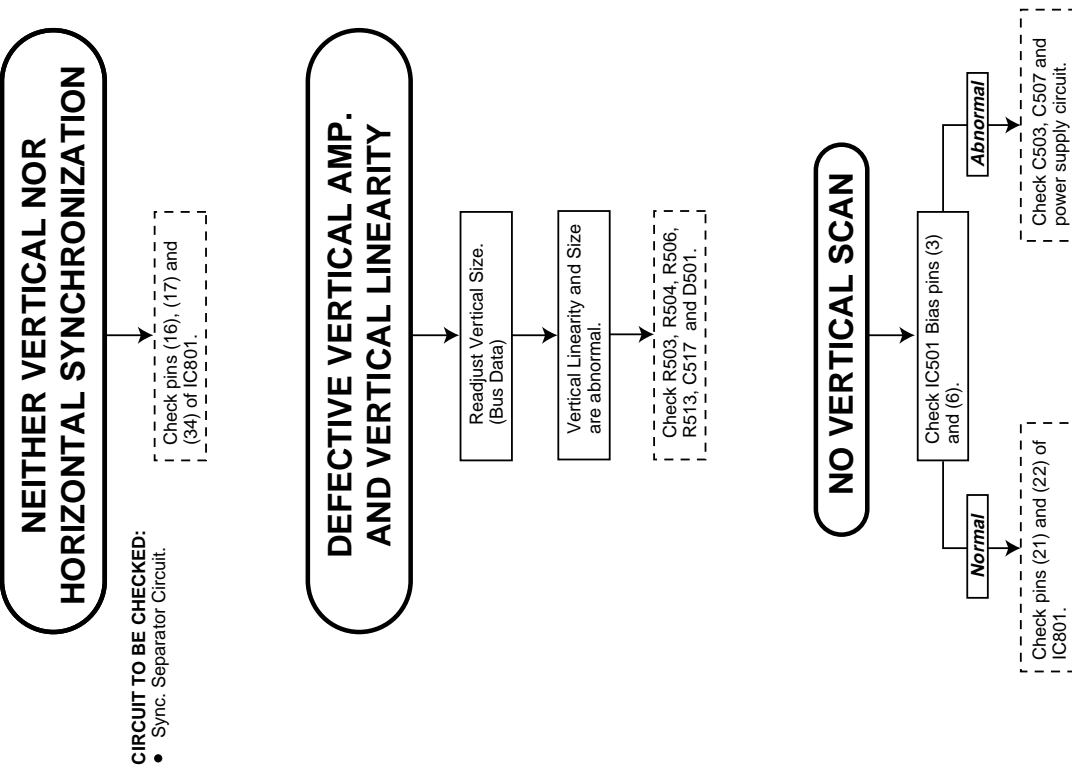


## TROUBLE SHOOTING TABLE (Continued)



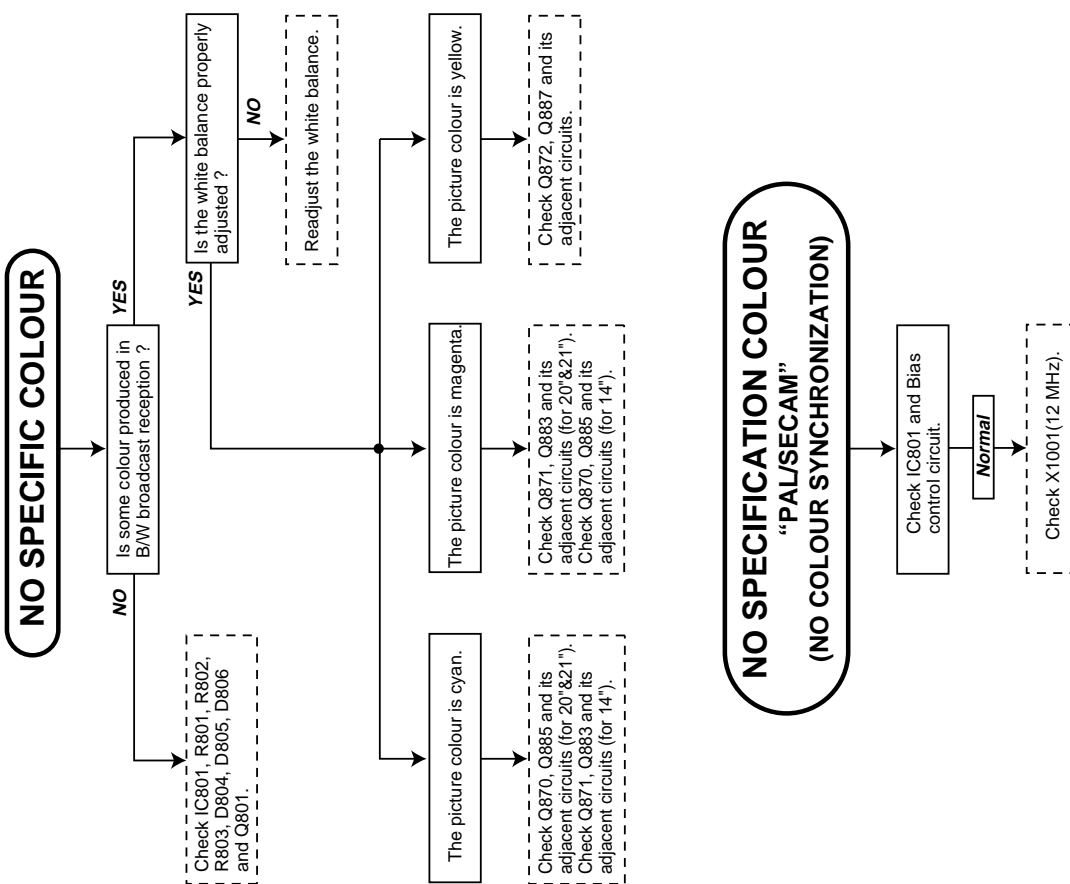
16-1

## TROUBLE SHOOTING TABLE (Continued)



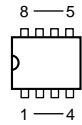
16-2

# TROUBLE SHOOTING TABLE (Continued)

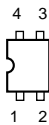


# SOLID STATE DEVICE BASE DIAGRAM

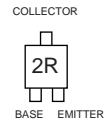
## TOP VIEW



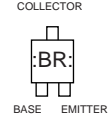
**M24C04W**



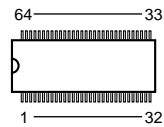
**FX0008GE**



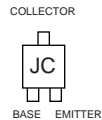
**D601A**



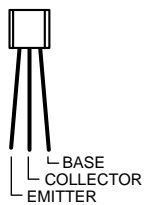
**B709A**



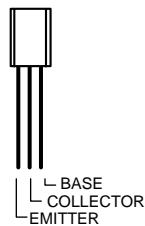
**IX3368CE**



**2SC2735**



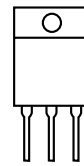
**2SC1815**



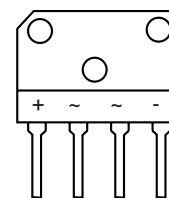
**2SC2482**



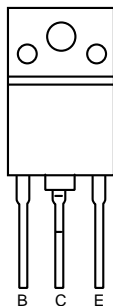
**PST573J**



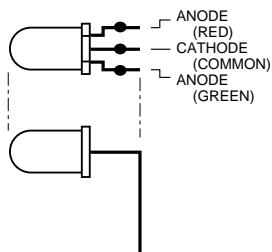
**SE115N**



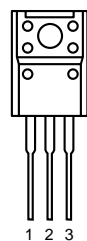
**DX0386CE**



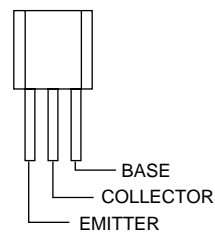
**2SD1877(14")  
2SD2586(20" & 21")**



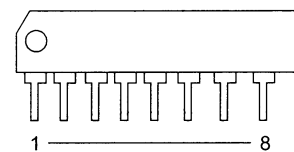
**PX0423CE**



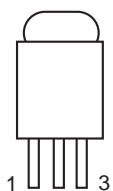
**KA7808  
KA7805**



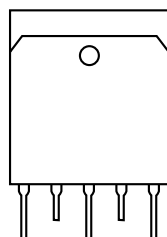
**BF421  
BF422**



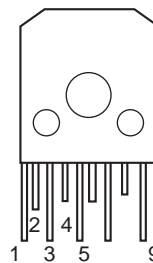
**LA7016**



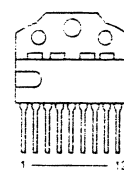
**TA48M033**



**STRF6653(14")  
STRF6654(20" & 21")**



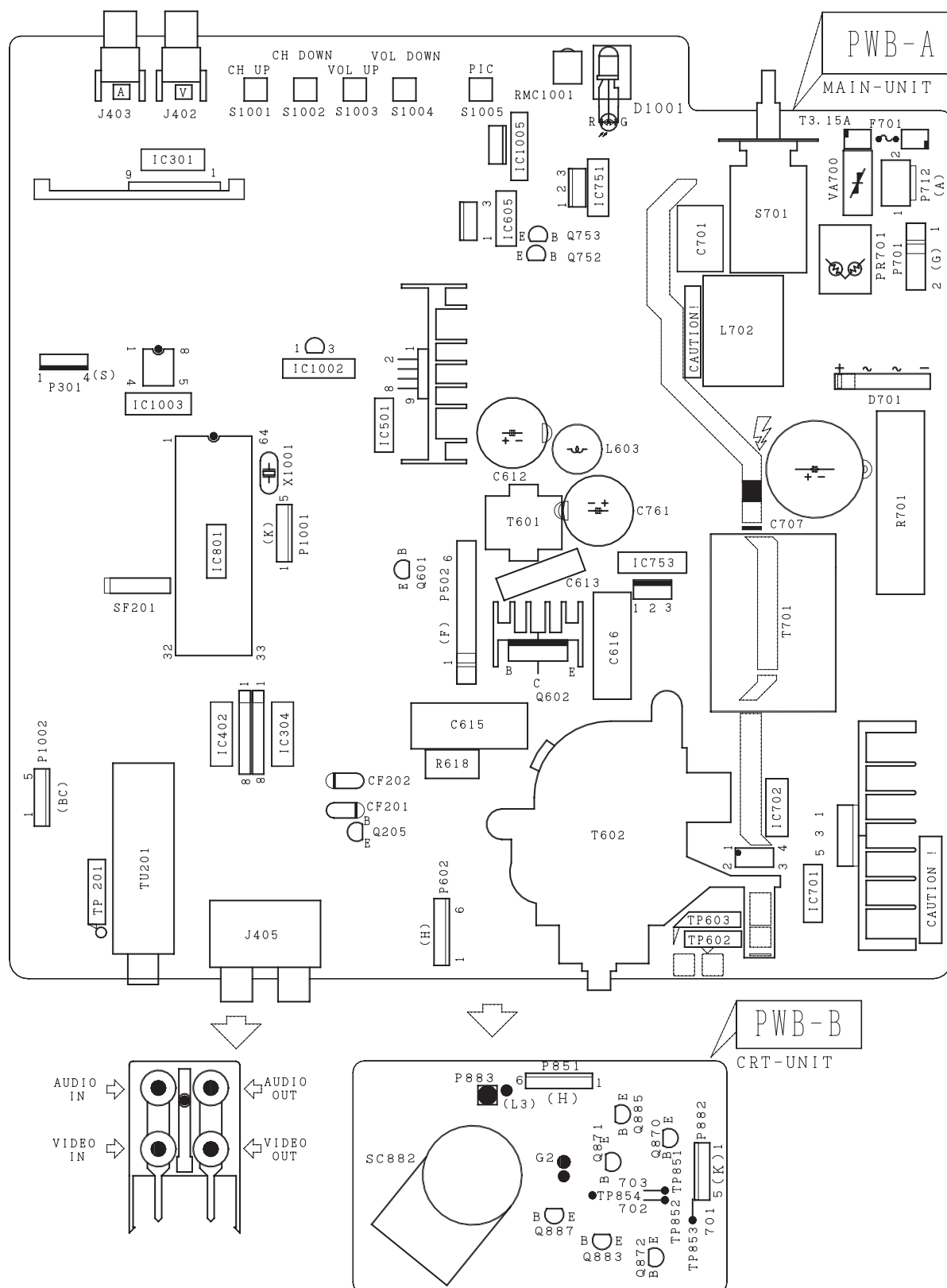
**TDA8357**



**TDA7056A**



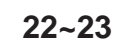
# CHASSIS LAYOUT : 20BM2S/G





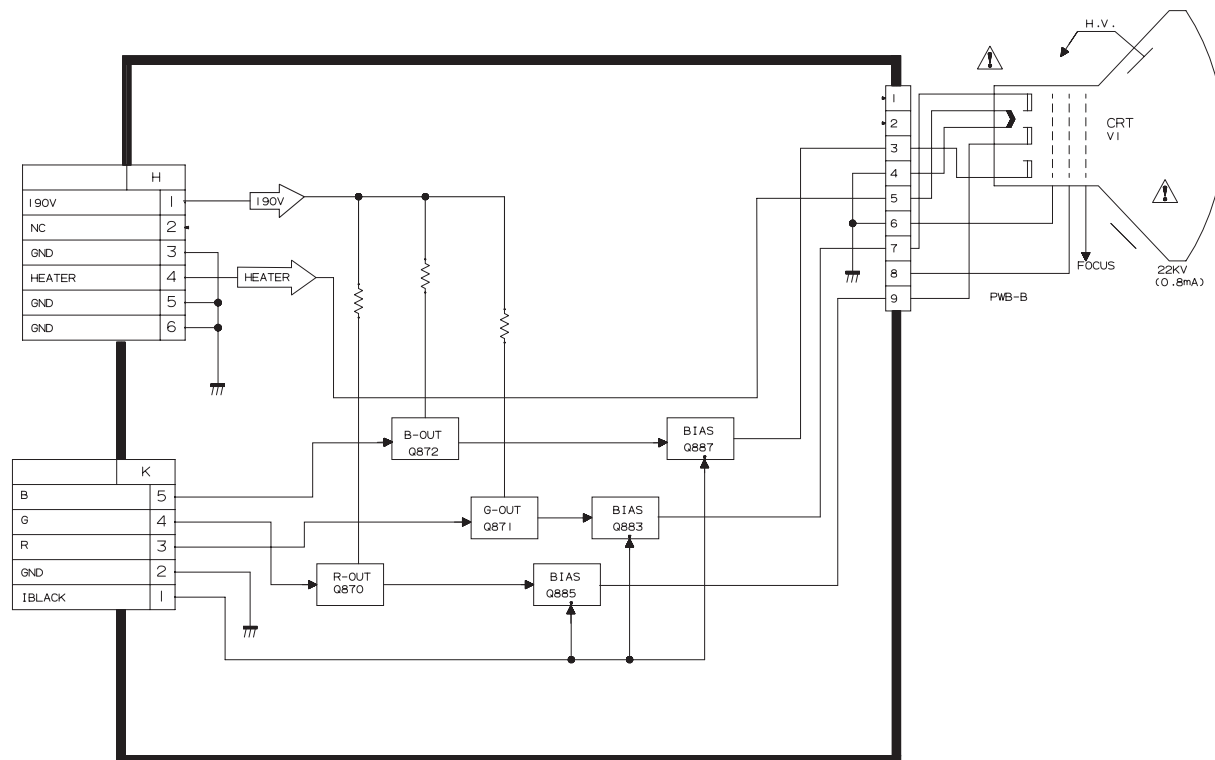


## PWB-A

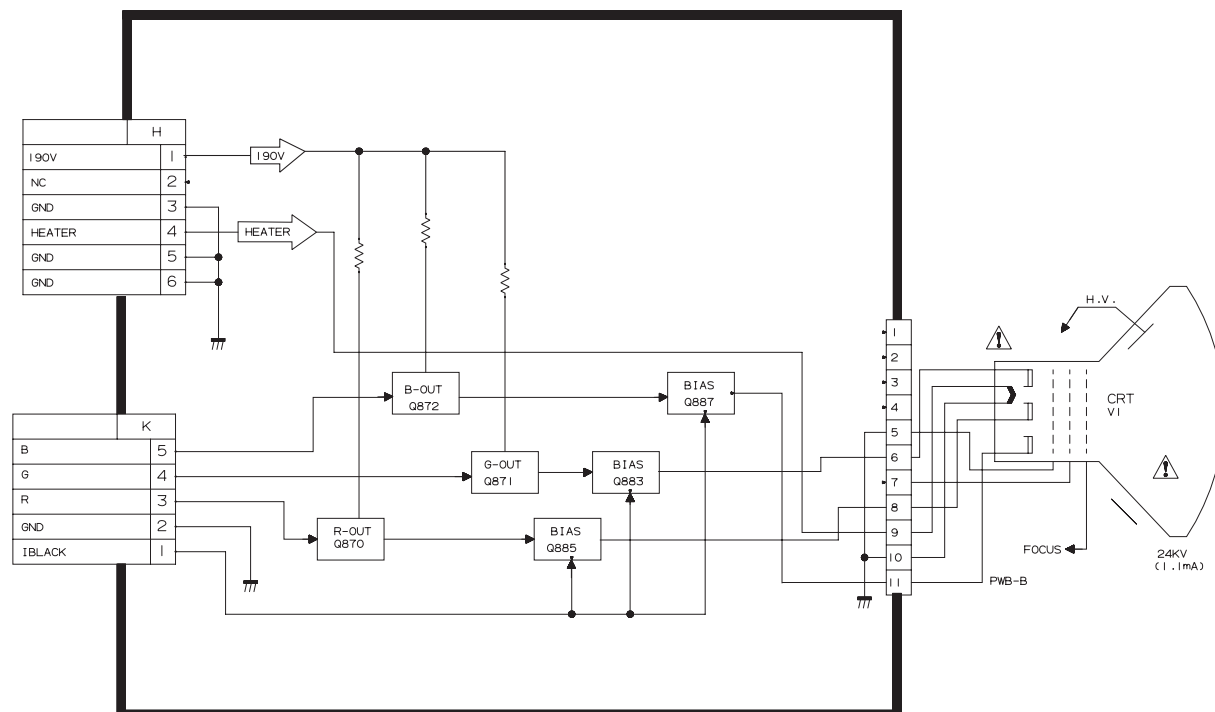


## BLOCK DIAGRAM

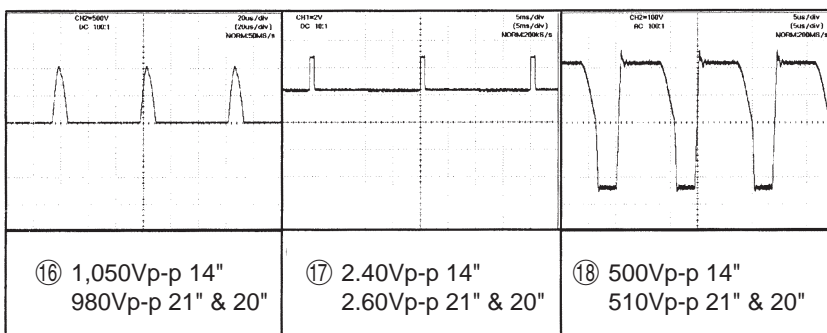
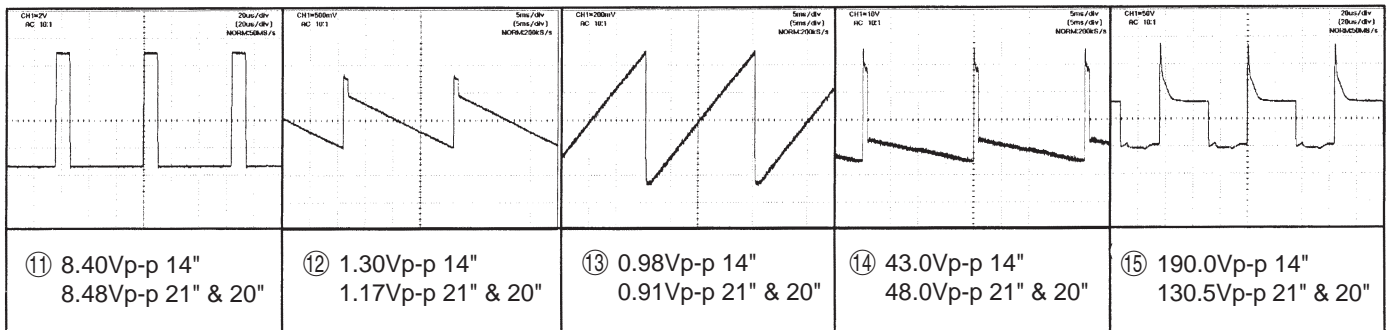
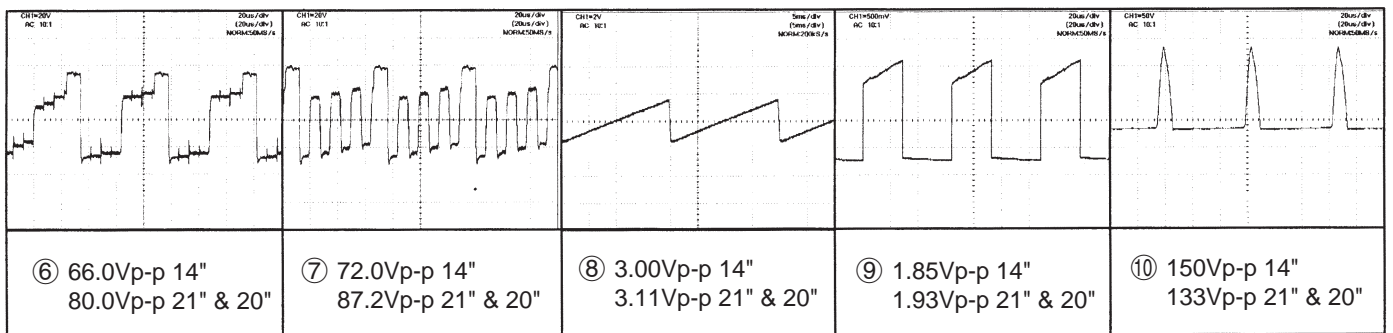
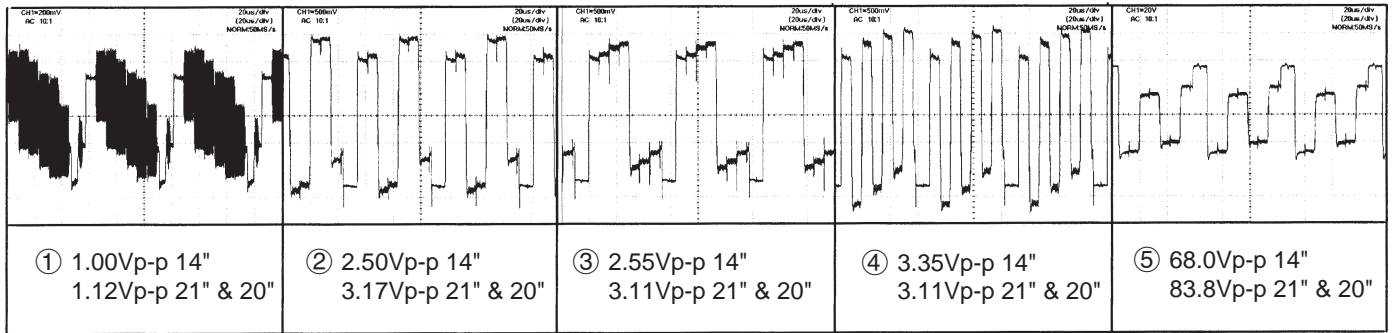
### CRT UNIT BLOCK DIAGRAM : 14BM2S/G



### CRT UNIT BLOCK DIAGRAM : 20BM2S/G/21BM2S/G



# WAVEFORMS





## DESCRIPTION OF SCHEMATIC DIAGRAM

### SAFETY NOTES:

1. DISCONNECT THE AC PLUG FROM THE AC OUTLET BEFORE REPLACING PARTS.
2. SEMICONDUCTOR HEAT SINKS SHOULD BE REGARDED AS POTENTIAL SHOCK HAZARDS WHEN THE CHASSIS IS OPERATING.

### IMPORTANT SAFETY NOTICE:

PARTS MARKED WITH "⚠" ( ) ARE IMPORTANT FOR MAINTAINING THE SAFETY OF THE SET. BE SURE TO REPLACE THESE PARTS WITH SPECIFIED ONES FOR MAINTAINING THE SAFETY AND PERFORMANCE OF THE SET.

### SERVICE PRECAUTION:

THE AREA ENCLOSED BY THIS LINE ( — — — ) IS DIRECTLY CONNECTED WITH AC MAINS VOLTAGE.  
WHEN SERVICING THE AREA, CONNECT AN ISOLATING TRANSFORMER BETWEEN TV RECEIVER AND AC LINE TO ELIMINATE HAZARD OF ELECTRIC SHOCK.

### NOTES:

1. The unit of resistance "ohm" is omitted.  
(K = 1000 ohms, M = Meg ohm).
2. All resistors are 1/16 watt, unless otherwise noted.
3. Unit of all capacitors are F with prefix symbol ( $\mu$ , P, ETC) .

### VOLTAGE MEASUREMENT CONDITIONS:

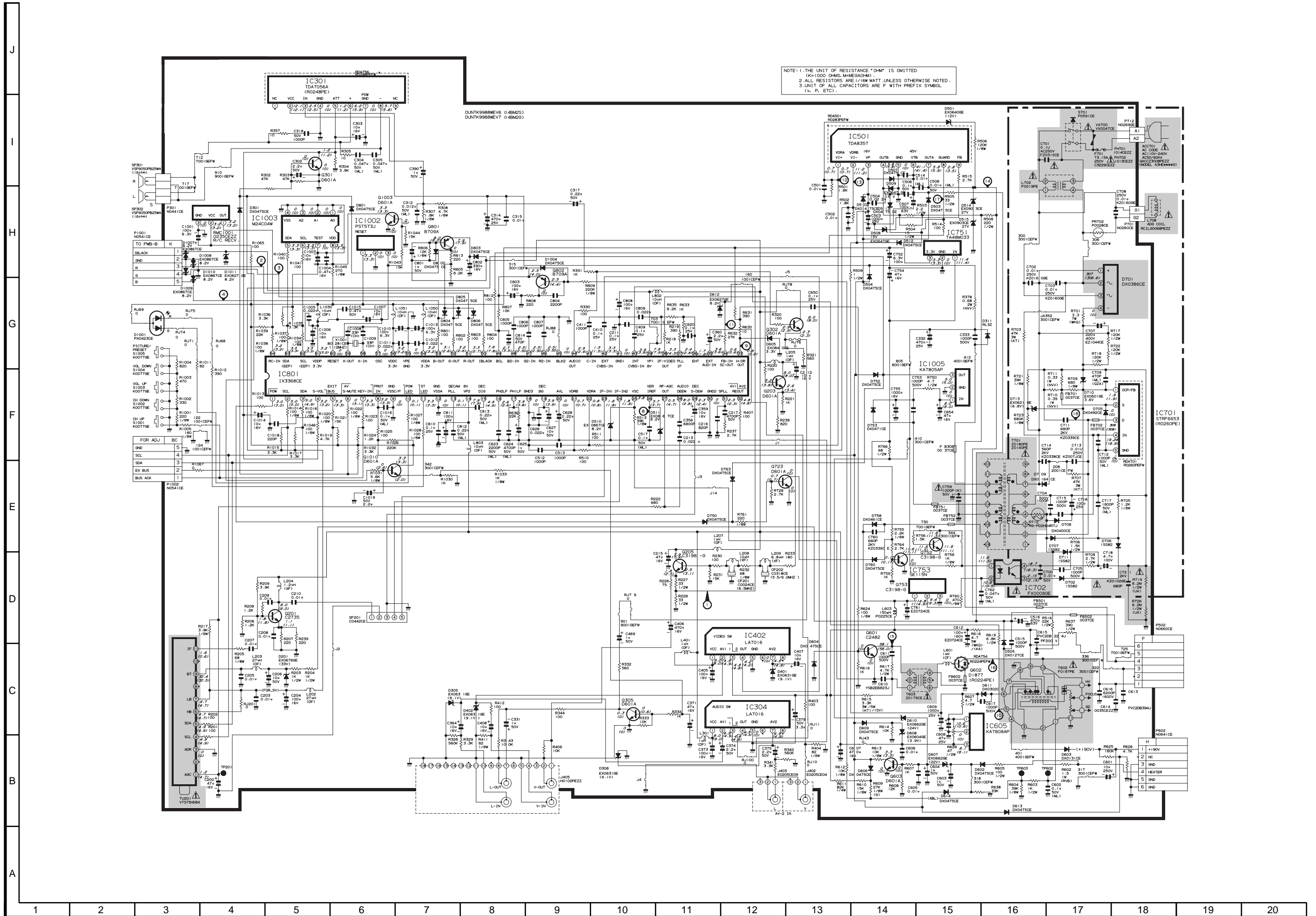
1. Voltage in parenthesis measured with no Signal.
2. Voltages without parenthesis measured with PAL Colour-Signal.
3. All the voltages in each point are measured with high impedance volt-meter.

### WAVEFORM MEASUREMENT CONDITIONS:

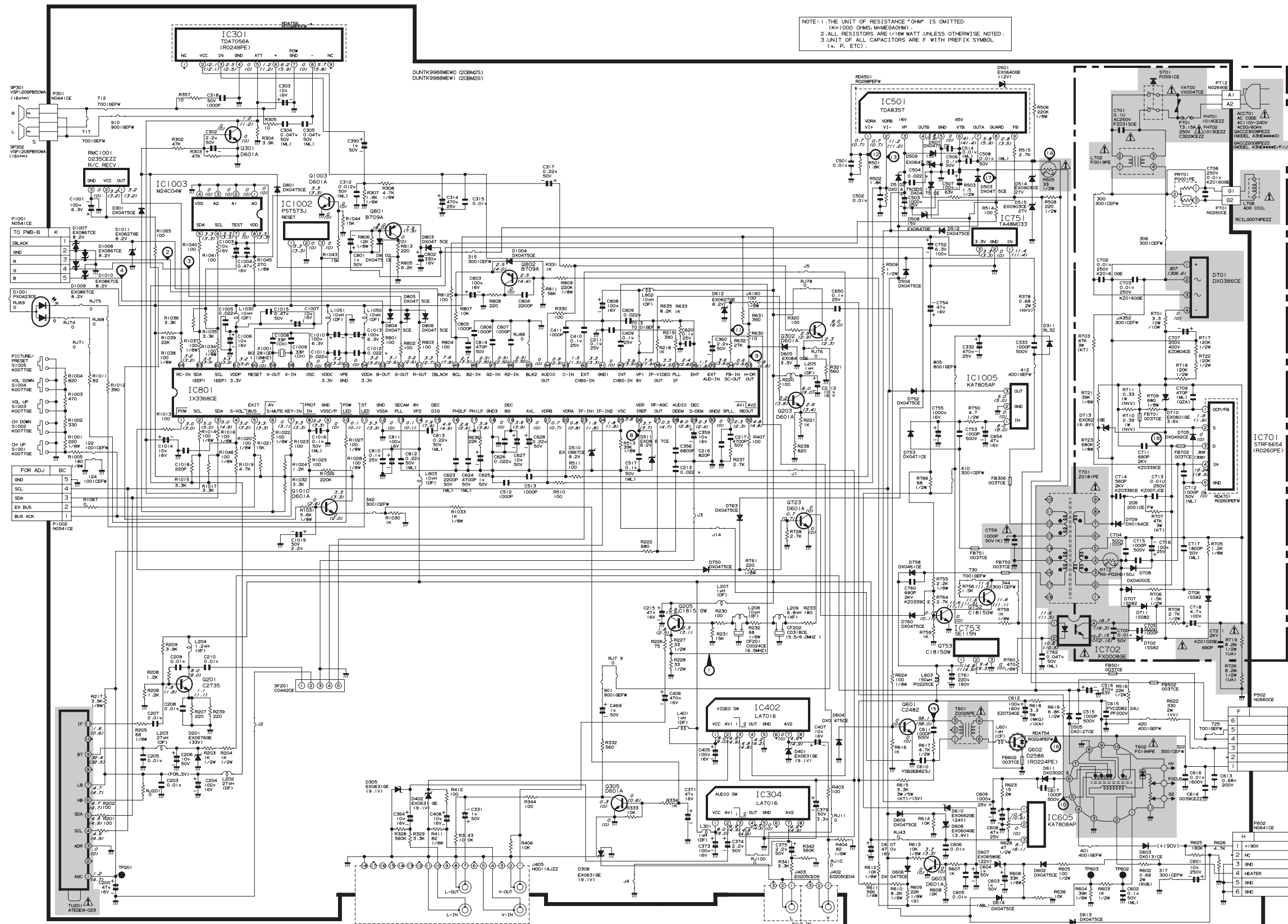
1. Colour bar generator signal of 1.8V peak to peak applied at Base of Video Buffer Amp. Q203.
2. Approximately 4.0 V AGC bias.



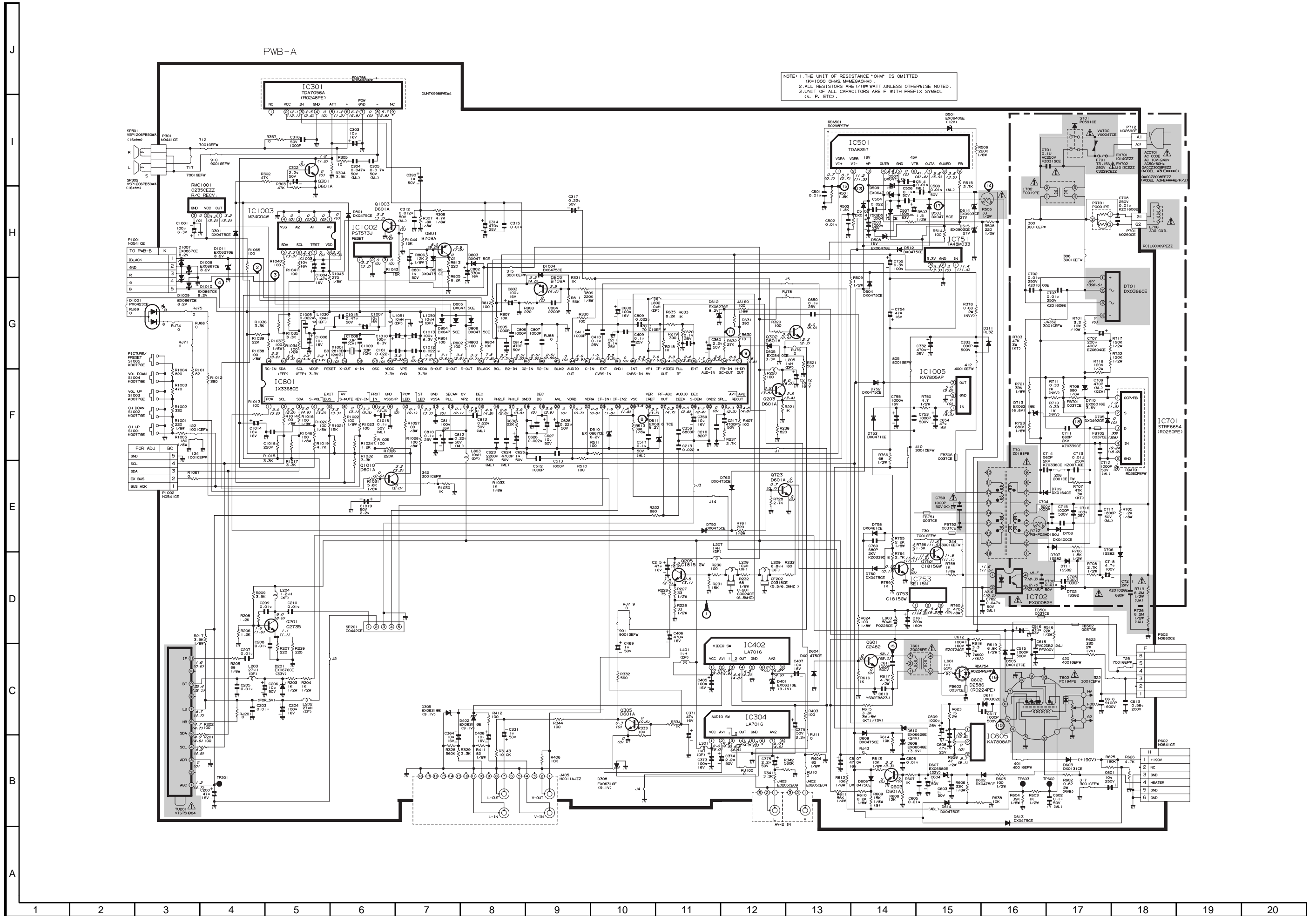
MAIN UNIT : 14BM2S/G



# MAIN UNIT : 20BM2S/G



# MAIN UNIT : 21BM2S/G

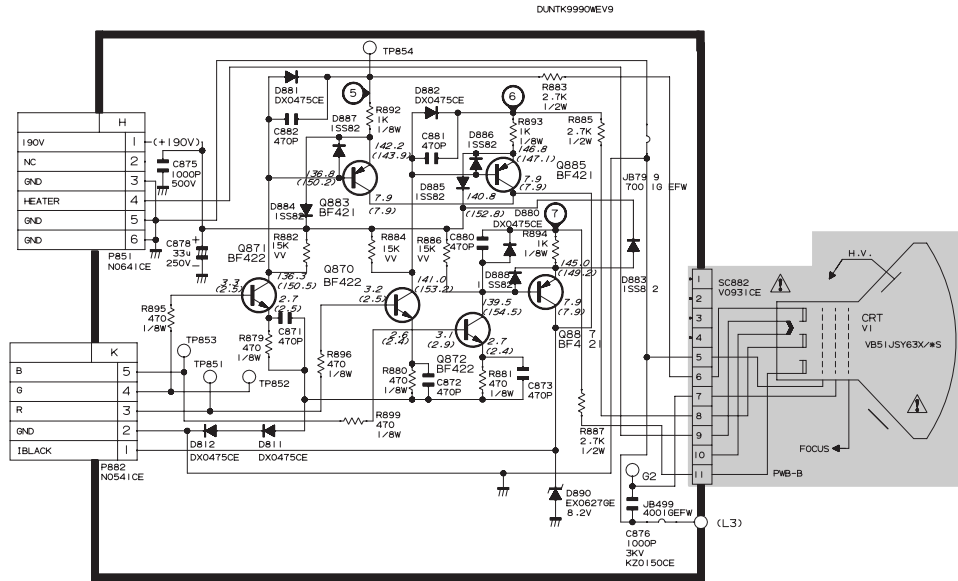






# CRT UNIT : 21BM2S/G

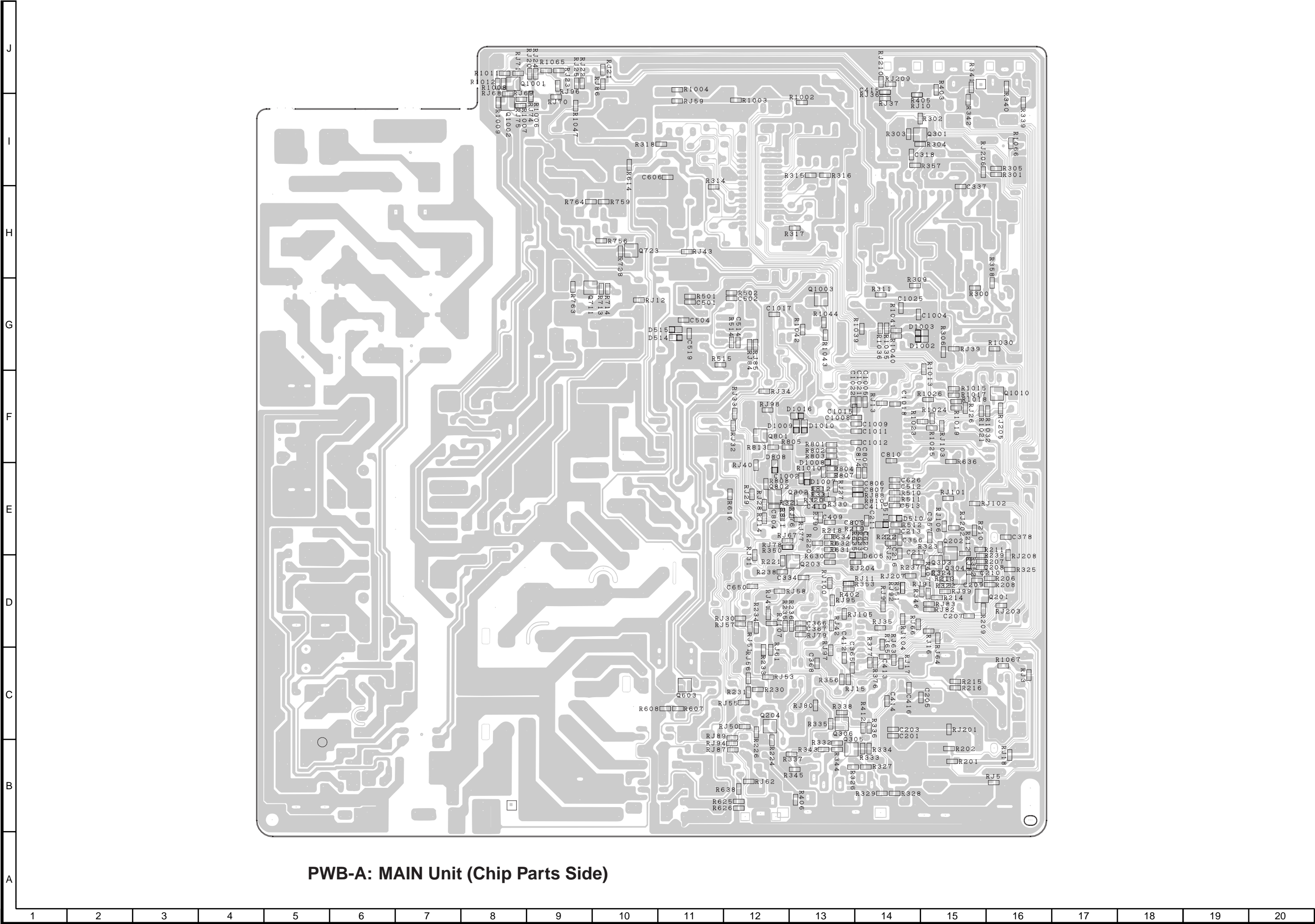
NOTE: 1. THE UNIT OF RESISTANCE "OHM" IS OMITTED  
(K=1000 OHMS, M=MEG OHM).  
2. ALL RESISTORS ARE 1/16W WATT UNLESS OTHERWISE NOTED.  
3. UNIT OF ALL CAPACITORS ARE P WITH PREFIX SYMBOL  
(u, P, ETC.).



This is a detailed wiring diagram of the PWB-A: MAIN Unit (Wiring Side). The diagram shows a complex arrangement of electronic components, including integrated circuits (ICs), resistors, capacitors, diodes, and transistors, all interconnected by a network of lines representing electrical connections. The components are labeled with various alphanumeric codes, such as IC1001, IC1002, IC1003, IC1004, IC1005, IC1006, IC1007, IC1008, IC1009, IC1010, IC1011, IC1012, IC1013, IC1014, IC1015, IC1016, IC1017, IC1018, IC1019, IC1020, IC1021, IC1022, IC1023, IC1024, IC1025, IC1026, IC1027, IC1028, IC1029, IC1030, IC1031, IC1032, IC1033, IC1034, IC1035, IC1036, IC1037, IC1038, IC1039, IC1040, IC1041, IC1042, IC1043, IC1044, IC1045, IC1046, IC1047, IC1048, IC1049, IC1050, IC1051, IC1052, IC1053, IC1054, IC1055, IC1056, IC1057, IC1058, IC1059, IC1060, IC1061, IC1062, IC1063, IC1064, IC1065, IC1066, IC1067, IC1068, IC1069, IC1070, IC1071, IC1072, IC1073, IC1074, IC1075, IC1076, IC1077, IC1078, IC1079, IC1080, IC1081, IC1082, IC1083, IC1084, IC1085, IC1086, IC1087, IC1088, IC1089, IC1090, IC1091, IC1092, IC1093, IC1094, IC1095, IC1096, IC1097, IC1098, IC1099, IC1100, IC1101, IC1102, IC1103, IC1104, IC1105, IC1106, IC1107, IC1108, IC1109, IC1110, IC1111, IC1112, IC1113, IC1114, IC1115, IC1116, 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## PWB-A: MAIN Unit (Wiring Side)







# REPLACEMENT PARTS LIST

## PARTS REPLACEMENT

Replacement parts which have these special safety characteristics identified in this manual: electrical components having such features are identified by "△" in the Replacement Parts Lists.

The use of a substitute replacement part which does not have the same safety characteristics as the factory recommended replacement parts shown in this service manual may create shock, fire or other hazards.

### "HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.

- |                 |                |
|-----------------|----------------|
| 1. MODEL NUMBER | 2. REF. NO.    |
| 3. PART NO.     | 4. DESCRIPTION |

MARK ★: SPARE PARTS-DELIVERY SECTION

Ref. No.	Part No.	★	Description	Code
<b>PICTURE TUBE</b>				
△	VB37GDA86X/1E	R	Picture Tube (14BM2S/G)	CB
△	VB510CKAY1S3E	R	Picture Tube (20BM2S/G)	CA
△	VB51JSY63X/*S	R	Picture Tube (21BM2S/G)	CE
△ L708	RCiLG0068PEZZ	R	Degaussing Coil (14BM2G)	AH
△ L708	RCiLG0095PEZZ	R	Degaussing Coil (14BM2S/G(γ))	AH
△ L708	RCiLG0074PEZZ	R	Degaussing Coil (20BM2S/G)	AQ
△ L708	RCiLG0069PEZZ	R	Degaussing Coil (21BM2S/G)	AR
	RCiLH0149PEZZ	R	Deflection Yoke (14BM2S/G)	BA
	RCiLH0146PEZZ	R	Deflection Yoke (21BM2S/G)	BF
	PMAGF3045CEZZ	R	Magnet(14BM2S/G)	AG
	PMAGF3046CEZZ	R	Magnet(21BM2S/G)	AF
	QEARC1422PEZZ	R	Grounding Strap (14BM2S/G)	AD
	QEARC2017PEZZ	R	Grounding Strap (20BM2S/G)	AE
	QEARC2107PEZZ	R	Grounding Strap (21BM2S/G)	AE

### PRINTED WIRING BOARD ASSEMBLIES (NOT REPLACEMENT ITEM)

PWB-A	DUNTK9988WEV6	-	Main Unit(14BM2S/G(γ))	—
PWB-A	DUNTK9988WEV7	-	Main Unit(14BM2G)	—
PWB-A	DUNTK9988WEW0	-	Main Unit(20BM2S)	—
PWB-A	DUNTK9988WEW1	-	Main Unit(20BM2G)	—
PWB-A	DUNTK9988WEW4	-	Main Unit(21BM2S/G)	—
PWB-B	DUNTK9990WEV0	-	CRT Unit(14BM2S/G(γ))	—
PWB-B	DUNTK9990WEV3	-	CRT Unit(14BM2G)	—
PWB-B	DUNTK9990WEV6	-	CRT Unit(20BM2S)	—
PWB-B	DUNTK9990WEV7	-	CRT Unit(20BM2G)	—
PWB-B	DUNTK9990WEV9	-	CRT Unit(21BM2S/G)	—

Ref. No. Part No. ★ Description Code

**DUNTK9988WEV6(14BM2S/G(γ))**  
**DUNTK9988WEV7(14BM2G)**  
**DUNTK9988WEW0(20BM2S)**  
**DUNTK9988WEW1(20BM2G)**  
**DUNTK9988WEW4(21BM2S/G)**  
**PWB-A : MAIN UNIT**

### TUNER

**NOTE: THE PARTS HERE SHOWN ARE SUPPLIED AS AN ASSEMBLY BUT NOT INDEPENDENTLY.**

△ TU201	VTUATEDE9-023	R	VHF Tuner(20BM2S/G)	BB
△ TU201	VTUVTST5HD84/	R	VHF Tuner (14BM2S/G/21BM2S/G)	BB

### INTEGRATED CIRCUITS

IC301	VHiTDA7056A-1	R	TDA7056A	AP
IC304	VHiLA7016//-1	R	LA7016, Audio SW	AH
IC501	VHiTDA8357/-1	R	TDA8357	AN
IC402	VHiLA7016//-1	R	LA7016, Video SW	AH
IC605	VHiKA7808AP-1	R	KA7808AP	AE
IC701	VHiSTRF6654-1	R	STRF6654 (20BM2S/G/21BM2S/G)	AX
IC701	VHiSTRF6653-1	R	STRF6653(14BM2S/G)	AS
IC751	VHiTA48M033-1	R	TA48M033	AH
IC753	VHiSE115N//-1	R	SE115N	AF
IC801	RH-iX3368CEN3	R	IX3368CE	BC
IC1002	VHiPST573J/-1	R	PST573J, Reset	AE
IC1003	VHiM24C04W/-1	R	M24C04W	AG
IC1005	VHiKA7805AP-1	R	KA7805AP	AE

### TRANSISTORS

Q201	VS2SC2735//1E	R	2SC2735	AC
Q203	VS2SD601A//-1	R	2SD601A	AC
Q205	VS2SC1815GW-1	R	2SC1815GW	AB
Q301	VS2SD601A//-1	R	2SD601A	AC
Q302	VS2SD601A//-1	R	2SD601A	AC
Q305	VS2SD601A//-1	R	2SD601A	AC
Q601	VS2SC2482//-1	R	2SC2482	AD
Q602	VS2SD1877//1E	R	2SD1877(14BM2S/G)	AL
Q602	VS2SD2586//1E	R	2SD2586 (20BM2S/G/21BM2S/G)	AM
Q603	VS2SD601A//-1	R	2SD601A	AC
Q723	VS2SD601A//-1	R	2SD601A	AC
Q752	VS2SC1815GW-1	R	2SC1815GW	AB
Q753	VS2SC1815GW-1	R	2SC1815GW	AB
Q801	VS2SB709A//-1	R	2SB709A	AA
Q802	VS2SB709A//-1	R	2SB709A	AA
Q1003	VS2SD601A//-1	R	2SD601A	AC
Q1010	VS2SD601A//-1	R	2SD601A	AC

### DIODES

D201	RH-EX0676GEZZ	R	Zener Diode	AA
D301	RH-DX0475CEZZ	R	DX0475CE	AB
D305	RH-EX0631GEZZ	R	Zener Diode	AA
D308	RH-EX0631GEZZ	R	Zener Diode	AA
D311	VHDRL3Z///-1	R	RL3Z	AE
D401	RH-EX0631GEZZ	R	Zener Diode	AA
D402	RH-EX0631GEZZ	R	Zener Diode	AA
D501	RH-EX0640GEZZ	R	Zener Diode	AA
D502	RH-DX0475CEZZ	R	DX0475CE	AB
D503	RH-DX0475CEZZ	R	DX0475CE	AB
D504	RH-DX0475CEZZ	R	DX0475CE	AB
D505	RH-DX0127CEZZ	R	DX0127CE	AC
D507	RH-DX0475CEZZ	R	DX0475CE	AB
D508	RH-EX0647GEZZ	R	Zener Diode	AA
D509	RH-EX0647GEZZ	R	Zener Diode	AA
D510	RH-EX0867CEZZ	R	Zener Diode	AC
D511	RH-EX0867CEZZ	R	Zener Diode	AC
D512	RH-DX0475CEZZ	R	DX0475CE	AB
D513	RH-DX0475CEZZ	R	DX0475CE	AB
D514	RH-EX0903CEZZ	R	Zener Diode	AC
D515	RH-EX0903CEZZ	R	Zener Diode	AC
D602	RH-DX0475CEZZ	R	DX0475CE	AB
D603	RH-DX0131CEZZ	R	DX0131CE	AC

Ref. No.	Part No.	★	Description	Code	Ref. No.	Part No.	★	Description	Code
D604	RH-DX0475CEZZ	R	DX0475CE	AB	<b>TRANSFORMERS</b>				
D605	RH-EX0840CEZZ	R	Zener Diode	AC	△ T601	RTRNZ0026PEZZ	R	Transformer	AH
D606	RH-DX0475CEZZ	R	DX0475CE	AB				(20BM2S/G/21BM2S/G)	
D607	RH-EX0658GEZZ	R	Zener Diode	AA	△ T602	RTRNF0187PEZZ	R	H-Volt Transformer	AY
			(20BM2S/G/21BM2S/G)					(14BM2S/G)	
D607	RH-EX0662GEZZ	R	Zener Diode(14BM2S/G)	AB	△ T602	RTRNF0194PEN1	R	H-Volt Transformer	AZ
D608	RH-EX0604GEZZ	R	Zener Diode	AB				(20BM2S/G/21BM2S/G)	
D609	RH-DX0475CEZZ	R	DX0475CE	AB	△ T603	RTRNZ0179CEZZ	R	Transformer(14BM2S/G)	AE
D610	RH-EX0662GEZZ	R	Zener Diode	AB	△ T701	RTRNZ0180PEZZ	R	Transformer(14BM2S/G(V))	AN
D611	RH-DX0302CEZZ	R	DX0302CE	AC	△ T701	RTRNZ0140PEZZ	R	Transformer(14BM2G)	AQ
D612	RH-EX0627GEZZ	R	Zener Diode	AA	△ T701	RTRNZ0181PEZZ	R	Transformer	AN
D613	RH-DX0475CEZZ	R	DX0475CE	AB				(20BM2S/G/21BM2S/G)	
D614	RH-DX0475CEZZ	R	DX0475CE	AB	<b>CAPACITORS</b>				
D701	RH-DX0386CEZZ	R	DX0386CE	AG	C200	VCEA0A1CW476M	R	47 16V Electrolytic	AB
D702	VHD1SS82///1A	R	1SS82	AC	C203	VCKYCY1HF103Z	R	0.01 50V Ceramic	AA
D705	RH-DX0492CEZZ	R	DX0492CE	AE	C204	VCEA0A1CW107M	R	100 16V Electrolytic	AC
D706	VHD1SS82///1A	R	1SS82	AC	C205	VCKYCY1HF103Z	R	0.01 50V Ceramic	AA
D707	VHD1SS82///1A	R	1SS82	AC	C206	VCEA0A1HW106M	R	10 50V Electrolytic	AB
D708	RH-DX0400CEZZ	R	DX0400CE	AC	C207	VCKYCY1HF103Z	R	0.01 50V Ceramic	AA
D709	RH-DX0164CEZZ	R	DX0164CE	AC	C208	VCKYCY1HF103Z	R	0.01 50V Ceramic	AA
D710	RH-EX0601GEZZ	R	Zener Diode	AA	C209	VCKYCY1HF103Z	R	0.01 50V Ceramic	AA
D711	VHD1SS82///1A	R	1SS82	AC	C210	VCKYCY1HF103Z	R	0.01 50V Ceramic	AA
D713	RH-EX0621GEZZ	R	Zener Diode	AB	C211	VCKYCY1EF104Z	R	0.1 25V Ceramic	AA
D750	RH-DX0475CEZZ	R	DX0475CE	AB	C212	VCEA0A1CW106M	R	10 16V Electrolytic	AB
D752	RH-DX0475CEZZ	R	DX0475CE	AB	C213	VCKYCY1HF223Z	R	0.022 50V Ceramic	AB
D753	RH-DX0471CEZZ	R	DX0471CE	AE	C215	VCEA0A1CW476M	R	47 16V Electrolytic	AB
D758	RH-DX0461CEZZ	R	DX0461CE	AG	C216	VCKYCY1HB821K	R	820p 50V Ceramic	AA
D760	RH-DX0475CEZZ	R	DX0475CE	AB	C217	VCKYCY1HB472K	R	4700p 50V Ceramic	AA
D763	RH-DX0475CEZZ	R	DX0475CE	AB	C302	VCEA0A1HW225M	R	2.2 50V Electrolytic	AB
D801	RH-DX0475CEZZ	R	DX0475CE	AB	C303	VCEA0A1CW106M	R	10 16V Electrolytic	AB
D802	RH-DX0475CEZZ	R	DX0475CE	AB	C304	VCQYTA1HM473J	R	0.047 50V Mylar	AA
D803	RH-DX0475CEZZ	R	DX0475CE	AB	C305	VCQYTA1HM473J	R	0.047 50V Mylar	AA
D804	RH-DX0475CEZZ	R	DX0475CE	AB	C312	VCQYTA1HM123J	R	0.012 50V Mylar	AA
D805	RH-DX0475CEZZ	R	DX0475CE	AB	C314	VCEA0A1EW477M	R	470 25V Electrolytic	AD
D806	RH-DX0475CEZZ	R	DX0475CE	AB	C315	VCKYPA1HF103Z	R	0.01 50V Ceramic	AA
D1001	RH-PX0423CEZZ	R	PhotoDiode	AD	C317	VCEA0A1HW224M	R	0.22 50V Electrolytic	AB
D1004	RH-DX0475CEZZ	R	DX0475CE	AB	C318	VCKYCY1HB102K	R	1000p 50V Ceramic	AA
D1007	RH-EX0867CEZZ	R	Zener Diode	AC	C331	VCEA0A1HW105M	R	1 50V Electrolytic	AB
D1008	RH-EX0867CEZZ	R	Zener Diode	AC	C332	VCEA0A1EW477M	R	470 25V Electrolytic	AD
D1009	RH-EX0867CEZZ	R	Zener Diode	AC	C333	VCKYPA2HB102K	R	1000p 500V Ceramic	AA
D1010	RH-EX0867CEZZ	R	Zener Diode	AC	C356	VCKYCY1HB682K	R	6800p 50V Ceramic	AA
D1011	RH-EX0627GEZZ	R	Zener Diode	AA	C359	VCEA9M1CW106M	R	10 16V Electrolytic	AB
△ IC702	RH-FX0008GEZZ	R	PC123FY8	AE	C360	VCEA9M1HW225M	R	2.2 50V Electrolytic	AB
△ VA700	RH-VX0047CEZZ	R	Varistor	AF	C364	VCEA0A1CW106M	R	10 16V Electrolytic	AB
<b>PACKAGED CIRCUITS</b>					C371	VCEA0A1CW476M	R	47 16V Electrolytic	AB
PR701	RMPTP0001PEZZ	R	Packaged Circuit	AN	C373	VCEA0A1CW107M	R	100 16V Electrolytic	AC
			(20BM2S/G/21BM2S/G)		C374	VCEA0A1HW225M	R	2.2 50V Electrolytic	AB
PR702	RMPTP0028CEZZ	R	Packaged Circuit	AG	C375	VCEAEA1HW225M	R	2.2 50V Electrolytic	AB
			(14BM2S/G)		C379	VCEA0A1HW335M	R	3.3 50V Electrolytic	AB
X1001	RCRSB0281CEZZ	R	Crystal, 12MHz	AG	C390	VCEA0A1HW105M	R	1 50V Electrolytic	AB
<b>FILTERS</b>					C405	VCEA0A1CW107M	R	100 16V Electrolytic	AC
CF201	RFILC0024CEZZ	R	Filter, FiLC0024CE	AE	C406	VCEA0A1CW477M	R	470 16V Electrolytic	AC
CF202	RFILC0318CEZZ	R	Filter, FiLC0318CE	AG	C407	VCEA0A1CW106M	R	10 16V Electrolytic	AB
SF201	RFILC0442CEZZ	R	Filter, FiLC0442CE	AL	C408	VCEA0A1CW106M	R	10 16V Electrolytic	AB
<b>COILS</b>					C409	VCKYCY1EF104Z	R	0.1 25V Ceramic	AA
L202	VP-DF270K0000	R	Peaking, 27μH	AB	C410	VCKYCY1EF104Z	R	0.1 25V Ceramic	AA
L203	VP-DF270K0000	R	Peaking, 27μH	AB	C411	VCKYCY1HB102K	R	1000p 50V Ceramic	AA
L204	VP-XF1R2K0000	R	Peaking, 1.2μH	AB	C469	VCEA0A1HW105M	R	1 50V Electrolytic	AB
L205	VP-DF1R0K0000	R	Peaking, 1μH	AB	C501	VCKYCY1HF103Z	R	0.01 50V Ceramic	AA
L207	VP-DF1R0K0000	R	Peaking, 1μH	AB	C502	VCKYCY1HF103Z	R	0.01 50V Ceramic	AA
L208	VP-XF100K0000	R	Peaking, 10μH	AB	C503	VCEA0A1EW108M	R	1000 25V Electrolytic	AD
L209	VP-XF6R8K0000	R	Peaking, 6.8μH	AB	C504	VCKYCY1HF223Z	R	0.022 50V Ceramic	AB
L301	VP-DF1R0K0000	R	Peaking, 1μH	AB	C506	VCQYTA1HM104J	R	0.1 50V Mylar	AA
L401	VP-DF1R0K0000	R	Peaking, 1μH	AB	C507	VCEA0A1JW107M	R	100 63V Electrolytic	AC
L601	VP-CF1R0M0000	R	Peaking, 1μH	AB	C508	VCQYTA1HM103J	R	0.01 50V Mylar	AA
L603	RCILP0225CEZZ	R	Coil, CiLP0225CE	AF	C512	VCKYCY1HB102K	R	1000p 50V Ceramic	AA
△ L702	RCILF0019PEZZ	R	Coil, CiLF0019PE	AN	C513	VCKYCY1HB102K	R	1000p 50V Ceramic	AA
L802	VP-DF100K0000	R	Peaking, 10μH	AB	C514	VCKYPA1HF103Z	R	0.01 50V Ceramic	AA
L803	VP-DF100K0000	R	Peaking, 10μH	AB	C515	VCKYPA2HB102K	R	1000p 500V Ceramic	AA
L1030	VP-DF100K0000	R	Peaking, 10μH	AB	C516	VCEA0A1JW477M	R	470 63V Electrolytic	AE
L1050	VP-DF100K0000	R	Peaking, 10μH	AB	C517	VCQYTA1HM104J	R	0.1 50V Mylar	AA
L1051	VP-DF100K0000	R	Peaking, 10μH	AB	C601	VCEAGA2EW106M	R	10 250V Electrolytic	AC
					C602	VCQYTA1HM104J	R	0.1 50V Mylar	AA
					C603	VCEA0A1HW105M	R	1 50V Electrolytic	AB
					C604	VCEA0A1HW105M	R	1 50V Electrolytic	AB
					C605	VCKYPA1HF103Z	R	0.01 50V Ceramic	AA

Ref. No.	Part No.	★	Description	Code	Ref. No.	Part No.	★	Description	Code
C606	VCKYCY1HF103Z	R 0.01	50V Ceramic	AA	C803	VCEA9M1CW107M	R 100	16V Electrolytic	AB
C607	VCEA0A1CW477M	R 470	16V Electrolytic	AC	C804	VCKYCY1HB222K	R 2200p	50V Ceramic	AA
C608	VCEA0A1EW476M	R 47	25V Electrolytic	AB	C805	VCKYCY1HB102K	R 1000p	50V Ceramic	AA
C609	VCEA0A1EW108M	R 1000	25V Electrolytic	AD	C806	VCKYCY1HB102K	R 1000p	50V Ceramic	AA
C610	VCFSB2EB823J	R 0.082	250V Metallized Polypro Film	AD	C807	VCKYCY1HB102K	R 1000p	50V Ceramic	AA
C611	VCKYPA2HB102K	R 1000p	500V Ceramic	AA	C808	VCEA0A1CW107M	R 100	16V Electrolytic	AC
C612	RC-EZ0724CEZZ	R 100	160V Electrolytic	AG	C809	VCKYCY1HF223Z	R 0.022	50V Ceramic	AB
C613	VCFPD2DB564J	R 0.56	200V Metallized Polypro Film	AF	C810	VCKYCY1EF104Z	R 0.1	25V Ceramic	AA
C613	VCFPD2DB684J	R 0.68	200V Metallized Polypro Film	AE	C811	VCEA0A1CW107M	R 100	16V Electrolytic	AC
C613	VCFPVC2DB394J	R 0.39	200V Metallized Polypro Film	AE	C812	VCFFA1HA224J	R 0.22	50V Mylar	AB
C614	RC-KZ0035CEZZ	R 220	2kV Ceramic	AB	C813	VCFFA1HA224J	R 0.22	50V Mylar	AB
C614	RC-KZ0039CEZZ	R 680p	2kV Ceramic	AB	C814	VCKYCY1HB471K	R 470p	50V Ceramic	AA
C615	VCFPVC2DB224J	R 0.22	200V Metallized Polypro Film	AE	C1001	VCEA0A0JW107M	R 100	6.3V Electrolytic	AB
C616	VCFPD3CA103H	R 0.01	1600V Metallized Polypro Film	AE	C1003	VCEA0A1CW106M	R 10	16V Electrolytic	AB
C616	VCFPD3CA622H	R 6200p	1600V Metallized Polypro Film	AE	C1004	VCKYCY1CF474Z	R 0.47	16V Ceramic	AB
C616	VCFPD3CA912H	R 9100p	1600V Metallized Polypro Film	AE	C1005	VCKYCY1HF223Z	R 0.022	50V Ceramic	AB
C617	VCKYPA2HB102K	R 1000p	500V Ceramic	AA	C1006	VCEA0A1CW106M	R 10	16V Electrolytic	AB
C620	VCKYCY1EF104Z	R 0.1	25V Ceramic	AA	C1007	VCEA0A1CW106M	R 10	16V Electrolytic	AB
C623	VCQYTA1HM222J	R 2200p	50V Mylar	AA	C1008	VCCCY1HH330J	R 33p	50V Ceramic	AA
C624	VCQYTA1HM472J	R 4700p	50V Mylar	AB	C1009	VCCCY1HH330J	R 33p	50V Ceramic	AA
C625	VCEA0A1HW105M	R 1	50V Electrolytic	AB	C1010	VCEA0A0JW107M	R 100	6.3V Electrolytic	AB
C626	VCKYCY1HF223Z	R 0.022	50V Ceramic	AB	C1011	VCKYCY1HF223Z	R 0.022	50V Ceramic	AB
C627	VCEA0A1HW106M	R 10	50V Electrolytic	AB	C1012	VCKYCY1HF223Z	R 0.022	50V Ceramic	AB
C628	VCEA0A1HW224M	R 0.22	50V Electrolytic	AB	C1013	VCEA0A0JW107M	R 100	6.3V Electrolytic	AB
C650	VCKYCY1EF104Z	R 0.1	25V Ceramic	AA	C1014	VCEA0A1CW106M	R 10	16V Electrolytic	AB
C654	VCEA0A1CW476M	R 47	16V Electrolytic	AB	C1015	VCFFA1HA474J	R 0.47	50V Mylar	AC
C700	VCQYTA1HM103J	R 0.01	50V Mylar	AA	C1016	VCQYTA1HM104J	R 0.1	50V Mylar	AA
⚠ C701	RC-FZ031SCEZZ	R 0.1	AC250V Plastic	AD	C1018	VCKYCY1HB221K	R 220p	50V Ceramic	AA
C702	RC-KZ0160GEZZ	R 0.01	250V Ceramic	AC	C1019	VCEA9M1HW225M	R 2.2	50V Electrolytic	AB
C703	RC-KZ0160GEZZ	R 0.01	250V Ceramic	AC	<b>RESISTORS</b>				
C704	VCKYPA2HB102K	R 1000p	500V Ceramic	AA	JA160	VRD-RA2BE101J	R 100	1/8W Carbon	AB
C705	VCKYPA2HB102K	R 1000p	500V Ceramic	AA	RJ2	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
C707	RC-EZ0804CEZZ	R 220	400V Electrolytic	AU	RJ5	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
C707	RC-EZ1044CEZZ	R 220	400V Electrolytic	AM	(14BM2S/G/21BM2S/G)				
C708	RC-KZ0160GEZZ	R 0.01	250V Ceramic	AC	RJ9	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
C709	RC-QZA471TAYJ	R 470	50V Mylar	AB	RJ10	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
C711	RC-KZ0339CEZZ	R 680p	2kV Ceramic	AD	RJ11	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
C712	VCQYTA1HM102J	R 1000p	50V Mylar	AA	RJ12	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
C713	RC-KZ007JCEZZ	R 0.01	250V Ceramic	AC	RJ13	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
C714	RC-KZ0338CEZZ	R 560p	2kV Ceramic	AD	RJ15	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
C715	VCKYPA2HB102K	R 1000p	500V Ceramic	AA	RJ16	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
C716	VCEA0A1EW107M	R 100	25V Electrolytic	AC	RJ21	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
C717	VCQYTA1HM182J	R 1800p	50V Mylar	AA	RJ25	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
C718	VCEAGA2AW475M	R 4.7	100V Electrolytic	AB	RJ26	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
⚠ C721	RC-KZ0102GEZZ	R 680p	2kV Ceramic	AE	RJ27	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
C752	VCEA0A0JW107M	R 100	6.3V Electrolytic	AB	RJ29	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
C753	VCKYPA2HB102K	R 1000p	500V Ceramic	AA	RJ30	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
C754	VCEA0A1CW476M	R 47	16V Electrolytic	AB	RJ31	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
C755	VCEA0A1CW108M	R 1000	16V Electrolytic	AD	RJ32	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
⚠ C759	VCKYPA1HB102K	R 1000p	50V Ceramic	AA	RJ33	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
C760	RC-KZ0339CEZZ	R 680p	2kV Ceramic	AD	RJ34	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
C761	RC-EZ0724CEZZ	R 100	160V Electrolytic	AG	RJ41	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
C761	VCEA4W2CN227M	R 220	160V Electrolytic	AG	RJ43	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
C762	VCQYTA1HM473J	R 0.047	50V Mylar	AA	RJ51	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
C801	VCEA0A1HW105M	R 1	50V Electrolytic	AB	RJ53	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
C802	VCEA0A1CW337M	R 330	16V Electrolytic	AC	RJ61	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
					RJ64	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
					RJ66	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
					RJ68	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
					RJ69	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
					RJ71	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
					RJ74	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
					RJ75	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
					RJ76	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
					RJ78	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
					RJ79	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
					RJ80	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
					RJ84	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
					RJ85	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
					RJ87	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
					RJ88	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
					RJ89	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
					RJ92	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
					RJ94	VRN-MD2AL000J	R 0	0.1W Metal Film	AA
					RJ96	VRN-MD2AL000J	R 0	0.1W Metal Film	AA

Ref. No.	Part No.	★	Description	Code	Ref. No.	Part No.	★	Description	Code
RJ97	VRN-MD2AL000J	R 0	0.1W Metal Film	AA	R508	VRD-RM2HD221J	R 220	1/2W Carbon	AA
RJ100	VRN-MD2AL000J	R 0	0.1W Metal Film	AA	R509	VRD-RM2HD1R0J	R 1	1/2W Carbon	AA
RJ103	VRN-MD2AL000J	R 0	0.1W Metal Film	AA	R510	VRN-MD2AL101J	R 100	0.1W Metal Film	AA
RJ105	VRN-MD2AL000J	R 0	0.1W Metal Film	AA	R511	VRN-MD2AL101J	R 100	0.1W Metal Film	AA
RJ201	VRN-MD2AL000J	R 0	0.1W Metal Film	AA	R513	VRD-RA2BE393J	R 39k	1/8W Carbon	AA
			(14BM2S/G/21BM2S/G)		R514	VRN-MD2AL101J	R 100	0.1W Metal Film	AA
RJ202	VRN-MD2AL000J	R 0	0.1W Metal Film	AA	R515	VRN-MD2AL272J	R 2.7k	0.1W Metal Film	AA
RJ204	VRN-MD2AL000J	R 0	0.1W Metal Film	AA	R516	VRD-RM2HD223J	R 22k	1/2W Carbon	AA
RJ205	VRN-MD2AL000J	R 0	0.1W Metal Film	AA	R602	VRN-VV3AB1R5J	R 1.5	1W Metal Film	AA
RJ206	VRN-MD2AL000J	R 0	0.1W Metal Film	AA				(14BM2S/G)	
			(14BM2S/G)		R602	VRN-VV3DBR68J	R 0.68	2W Metal Film	AA
RJ206	VRS-CY1JF000J	R 0	1/16W Metal Oxide	AA				(20BM2S/G)	
			(20BM2S/G/21BM2S/G)		R602	VRN-VV3DBR82J	R 0.82	2W Metal Film	AB
			(21BM2S/G)					(21BM2S/G)	
R201	VRN-MD2AL101J	R 100	0.1W Metal Film	AA	R603	VRD-RM2HD102J	R 1k	1/2W Carbon	AA
R202	VRN-MD2AL101J	R 100	0.1W Metal Film	AA	R604	VRD-RA2BE393J	R 39k	1/8W Carbon	AA
R203	VRD-RM2HD102J	R 1k	1/2W Carbon	AA	R605	VRD-RM2HD101J	R 100	1/2W Carbon	AA
R204	VRD-RM2HD102J	R 1k	1/2W Carbon	AA	R606	VRD-RA2BE333J	R 33k	1/8W Carbon	AA
R205	VRD-RA2BE680J	R 68	1/8W Carbon	AA				(20BM2S/G/21BM2S/G)	
R206	VRN-MD2AL122J	R 1.2k	0.1W Metal Film	AA	R607	VRN-MD2AL102J	R 1k	0.1W Metal Film	AA
R207	VRN-MD2AL221J	R 220	0.1W Metal Film	AA	R608	VRN-MD2AL123J	R 12k	0.1W Metal Film	AA
R208	VRN-MD2AL122J	R 1.2k	0.1W Metal Film	AA	R609	VRD-RA2BE153G	R 15k	1/8W Carbon	AA
R209	VRN-MD2AL392J	R 3.9k	0.1W Metal Film	AA				(21BM2S/G)	
R217	VRD-RA2BE392J	R 3.9k	1/8W Carbon	AA	R609	VRD-RA2BE223G	R 22k	1/8W Carbon	AA
R218	VRN-MD2AL102J	R 1k	0.1W Metal Film	AA				(20BM2S/G)	
R219	VRN-MD2AL391J	R 390	0.1W Metal Film	AA	R609	VRD-RA2BE273G	R 27k	1/8W Carbon	AA
R220	VRN-MD2AL101J	R 100	0.1W Metal Film	AA				(14BM2S/G)	
R221	VRN-MD2AL102J	R 1k	0.1W Metal Film	AA	R610	VRD-RA2BE153J	R 15k	1/8W Carbon	AA
R222	VRN-MD2AL681J	R 680	0.1W Metal Film	AA				(14BM2S/G)	
R226	VRN-MD2AL750J	R 75	0.1W Metal Film	AA	R610	VRD-RA2BE822J	R 8.2k	1/8W Carbon	AA
R227	VRD-RM2HD330J	R 33	1/2W Carbon	AA				(20BM2S/G/21BM2S/G)	
R228	VRD-RM2HD330J	R 33	1/2W Carbon	AA	R611	VRD-RA2EE563G	R 56k	1/4W Carbon	AA
R230	VRN-MD2AL101J	R 100	0.1W Metal Film	AA				(20BM2S/G/21BM2S/G)	
R231	VRN-MD2AL153J	R 15k	0.1W Metal Film	AA	R611	VRD-RA2EE823G	R 82k	1/4W Carbon	AA
R232	VRD-RA2BE680J	R 68	1/8W Carbon	AA				(14BM2S/G)	
R233	VRN-MD2AL181J	R 180	0.1W Metal Film	AA	R612	VRD-RA2BE103J	R 10k	1/8W Carbon	AA
R237	VRN-MD2AL272J	R 2.7k	0.1W Metal Film	AA	R613	VRD-RA2BE103J	R 10k	1/8W Carbon	AA
R238	VRN-MD2AL821J	R 820	0.1W Metal Film	AA	R614	VRN-MD2AL103J	R 10k	0.1W Metal Film	AA
R239	VRN-MD2AL221J	R 220	0.1W Metal Film	AA	R615	VRS-KT3LB332J	R 3.3k	3W Metal Oxide	AC
R302	VRN-MD2AL473J	R 47k	0.1W Metal Film	AA	R616	VRN-MD2AL102J	R 1k	0.1W Metal Film	AA
R303	VRN-MD2AL473J	R 47k	0.1W Metal Film	AA	R617	VRD-RM2HD472J	R 4.7k	1/2W Carbon	AA
R304	VRN-MD2AL392J	R 3.9k	0.1W Metal Film	AA	R618	VRS-KA3HG3R3K	R 3.3	5W Metal Oxide	AD
R305	VRN-MD2AL100J	R 10	0.1W Metal Film	AA				(20BM2S/G/21BM2S/G)	
R307	VRD-RA2BE182J	R 1.8k	1/8W Carbon	AA	R618	VRS-KA3HG4R7K	R 4.7	5W Metal Oxide	AD
R308	VRD-RA2BE472J	R 4.7k	1/8W Carbon	AA				(14BM2S/G)	
R320	VRN-MD2AL101J	R 100	0.1W Metal Film	AA	R619	VRD-RM2HD682J	R 6.8k	1/2W Carbon	AA
R321	VRN-MD2AL561J	R 560	0.1W Metal Film	AA	R622	VRS-VV3DB331J	R 330	2W Metal Oxide	AA
R328	VRN-MD2AL564J	R 560k	0.1W Metal Film	AA				(20BM2S/G/21BM2S/G)	
R329	VRN-MD2AL332J	R 3.3k	0.1W Metal Film	AA	R623	VRS-VV3DB150J	R 15	2W Metal Oxide	AA
R330	VRN-MD2AL101J	R 100	0.1W Metal Film	AA				(20BM2S/G/21BM2S/G)	
R331	VRN-MD2AL102J	R 1k	0.1W Metal Film	AA	R624	VRD-RA2BE101J	R 100	1/8W Carbon	AB
R332	VRN-MD2AL561J	R 560	0.1W Metal Film	AA	R625	VRN-MD2AL184J	R 180k	0.1W Metal Film	AA
R333	VRN-MD2AL103J	R 10k	0.1W Metal Film	AA	R626	VRN-MD2AL472J	R 4.7k	0.1W Metal Film	AA
R334	VRN-MD2AL102J	R 1k	0.1W Metal Film	AA	R627	VRD-RM2HD4R7J	R 4.7	1/2W Carbon	AA
R341	VRN-MD2AL332J	R 3.3k	0.1W Metal Film	AA				(14BM2S/G)	
R342	VRN-MD2AL564J	R 560k	0.1W Metal Film	AA	R628	VRD-RM2HD470J	R 47	1/2W Carbon	AA
R343	VRN-MD2AL104J	R 100k	0.1W Metal Film	AA	R630	VRN-MD2AL100J	R 10	0.1W Metal Film	AA
R344	VRN-MD2AL101J	R 100	0.1W Metal Film	AA	R631	VRN-MD2AL391J	R 390	0.1W Metal Film	AA
R357	VRN-MD2AL100J	R 10	0.1W Metal Film	AA	R632	VRN-MD2AL273J	R 27k	0.1W Metal Film	AA
R378	VRN-VV3DBR68J	R 0.68	2W Metal Film	AA	R633	VRN-MD2AL102J	R 1k	0.1W Metal Film	AA
R403	VRN-MD2AL101J	R 100	0.1W Metal Film	AA	R635	VRN-MD2AL822J	R 8.2k	0.1W Metal Film	AA
R404	VRD-RA2BE820J	R 82	1/8W Carbon	AA	R636	VRN-MD2AL223J	R 22k	0.1W Metal Film	AA
R406	VRN-MD2AL103J	R 10k	0.1W Metal Film	AA	R637	VRD-RM2HD391J	R 390	1/2W Carbon	AA
R407	VRN-MD2AL101J	R 100	0.1W Metal Film	AA				(14BM2S/G)	
R411	VRD-RA2BE820J	R 82	1/8W Carbon	AA	R638	VRN-MD2AL103J	R 10k	0.1W Metal Film	AA
R412	VRN-MD2AL101J	R 100	0.1W Metal Film	AA				(20BM2S/G/21BM2S/G)	
R501	VRN-MD2AL182J	R 1.8k	0.1W Metal Film	AA	R638	VRN-MD2AL333J	R 33k	0.1W Metal Film	AA
R502	VRN-MD2AL182J	R 1.8k	0.1W Metal Film	AA				(14BM2S/G)	
R503	VRD-RM2HD1R5J	R 1.5	1/2W Carbon	AA	R701	VRW-KQ3NC3R3K	R 3.3	7W Cement	AE
			(20BM2S/G/21BM2S/G)					(14BM2S/G)	
R503	VRD-RM2HD2R2J	R 2.2	1/2W Carbon	AA	R701	VRW-KQ4AC3R3K	R 3.3	10W Cement	AE
			(14BM2S/G)					(20BM2S/G/21BM2S/G)	
R504	VRD-RM2HD150J	R 15	1/2W Carbon	AA				(21BM2S/G)	
			(14BM2S/G)		R703	VRS-KT3LB473J	R 47k	3W Metal Oxide	AE
⚠ R505	VRG-PD2HD330J	R 33	1/2W Fuse Resistor	AC	R705	VRD-RA2BE122J	R 1.2k	1/8W Carbon	AA
R506	VRD-RA2BE124J	R 120k	1/8W Carbon	AA	R706	VRD-RM2HD152J	R 1.5k	1/2W Carbon	AA
			(14BM2S/G)		R707	VRS-KT3LB473J	R 47k	3W Metal Oxide	AE
R506	VRD-RA2BE224J	R 220k	1/8W Carbon	AA	R708	VRD-RM2HD272J	R 2.7k	1/2W Carbon	AA
			(20BM2S/G/21BM2S/G)						

Ref. No.	Part No.	★	Description	Code
R709	VRD-RA2BE681J	R 680	1/8W Carbon	AA
R710	VRN-VV3ABR39J	R 0.39	1W Metal Film	AA
R711	VRN-VV3ABR33J	R 0.33	1W Metal Film	AA
△ R712	VRG-PD2HD150J	R 15	1/2W (20BM2S/G/21BM2S/G)	AC
△ R712	VRG-PD2HD4R7J	R 4.7	1/2W (14BM2S/G)	AC
R717	VRD-RM2HD124J	R 120k	1/2W Carbon	AA
R718	VRD-RM2HD124J	R 120k	1/2W Carbon	AA
△ R719	VRC-UA2HG825K	R 8.2M	1/2W Solid	AA
R721	VRD-RA2BE393J	R 39k	1/8W Carbon	AA
R722	VRD-RM2HD124J	R 120k	1/2W Carbon	AA
R723	VRD-RA2BE684J	R 680k	1/8W Carbon	AA
△ R726	VRC-UA2HG825K	R 8.2M	1/2W Solid	AA
R728	VRN-MD2AL272J	R 2.7k	0.1W Metal Film	AA
R750	VRD-RM2HD4R7J	R 4.7	1/2W Carbon	AA
R755	VRD-RA2BE222J	R 2.2k	1/8W Carbon	AA
R756	VRN-MD2AL152J	R 1.5k	0.1W Metal Film	AA
R758	VRD-RA2BE102J	R 1k	1/8W Carbon	AA
R759	VRN-MD2AL102J	R 1k	0.1W Metal Film	AA
R760	VRD-RA2BE471J	R 470	1/8W Carbon	AA
R761	VRD-RA2BE221J	R 220	1/8W Carbon	AA
R764	VRN-MD2AL272J	R 2.7k	0.1W Metal Film	AA
R766	VRD-RM2HD680J	R 68	1/2W Carbon	AA
R801	VRN-MD2AL101J	R 100	0.1W Metal Film	AA
R802	VRN-MD2AL101J	R 100	0.1W Metal Film	AA
R803	VRN-MD2AL101J	R 100	0.1W Metal Film	AA
R804	VRN-MD2AL101J	R 100	0.1W Metal Film	AA
R805	VRN-MD2AL822J	R 8.2k	0.1W Metal Film	AA
R806	VRD-RA2BE123J	R 12k	1/8W Carbon	AA
R807	VRN-MD2AL103J	R 10k	0.1W Metal Film	AA
R808	VRN-MD2AL221J	R 220	0.1W Metal Film	AA
R809	VRD-RA2BE224J	R 220k	1/8W Carbon	AA
R811	VRN-MD2AL563J	R 56k	0.1W Metal Film (20BM2S/G/21BM2S/G)	AA
R812	VRN-MD2AL101J	R 100	0.1W Metal Film	AA
R813	VRN-MD2AL221J	R 220	0.1W Metal Film	AA
R1001	VRD-RA2BE221J	R 220	1/8W Carbon	AA
R1002	VRN-MD2AL331J	R 330	0.1W Metal Film	AA
R1003	VRN-MD2AL471J	R 470	0.1W Metal Film	AA
R1004	VRN-MD2AL821J	R 820	0.1W Metal Film	AA
R1005	VRD-RA2BE181J	R 180	1/8W Carbon	AA
R1011	VRN-MD2AL820J	R 82	0.1W Metal Film	AA
R1012	VRN-MD2AL391J	R 390	0.1W Metal Film	AA
R1013	VRN-MD2AL101J	R 100	0.1W Metal Film	AA
R1014	VRD-RA2BE101J	R 100	1/8W Carbon	AB
R1015	VRN-MD2AL332J	R 3.3k	0.1W Metal Film	AA
R1016	VRD-RA2BE101J	R 100	1/8W Carbon	AB
R1017	VRN-MD2AL332J	R 3.3k	0.1W Metal Film	AA
R1019	VRN-MD2AL472J	R 4.7k	0.1W Metal Film	AA
R1020	VRD-RA2BE101J	R 100	1/8W Carbon	AB
R1021	VRN-MD2AL153J	R 15k	0.1W Metal Film	AA
R1022	VRD-RA2BE101J	R 100	1/8W Carbon	AB
R1023	VRN-MD2AL101J	R 100	0.1W Metal Film	AA
R1024	VRN-MD2AL122J	R 1.2k	0.1W Metal Film	AA
R1025	VRN-MD2AL101J	R 100	0.1W Metal Film	AA
R1026	VRN-MD2AL224J	R 220k	0.1W Metal Film	AA
R1027	VRD-RA2BE101J	R 100	1/8W Carbon	AB
R1028	VRD-RA2BE101J	R 100	1/8W Carbon	AB
R1030	VRN-MD2AL102J	R 1k	0.1W Metal Film	AA
R1031	VRD-RA2BE562J	R 5.6k	1/8W Carbon	AA
R1032	VRN-MD2AL332J	R 3.3k	0.1W Metal Film	AA
R1033	VRD-RA2BE102J	R 1k	1/8W Carbon	AA
R1034	VRD-RA2BE101J	R 100	1/8W Carbon	AB
R1035	VRN-MD2AL332J	R 3.3k	0.1W Metal Film	AA
R1036	VRN-MD2AL332J	R 3.3k	0.1W Metal Film	AA
R1037	VRD-RA2BE101J	R 100	1/8W Carbon	AB
R1038	VRD-RA2BE101J	R 100	1/8W Carbon	AB
R1039	VRN-MD2AL223J	R 22k	0.1W Metal Film	AA
R1040	VRN-MD2AL101J	R 100	0.1W Metal Film	AA
R1041	VRN-MD2AL101J	R 100	0.1W Metal Film	AA
R1043	VRN-MD2AL153J	R 15k	0.1W Metal Film	AA
R1044	VRN-MD2AL153J	R 15k	0.1W Metal Film	AA
R1045	VRD-RA2BE271J	R 270	1/8W Carbon	AA
R1046	VRD-RA2BE101J	R 100	1/8W Carbon	AB
R1065	VRN-MD2AL101J	R 100	0.1W Metal Film	AA
R1067	VRN-MD2AL000J	R 0	0.1W Metal Film	AA

Ref. No.	Part No.	★	Description	Code
<b>BALUNES</b>				
FB306	RBLN-0037CEZZ	R	Balun, BLN-0037CE	AB
FB501	RBLN-0037CEZZ	R	Balun, BLN-0037CE	AB
FB502	RBLN-0037CEZZ	R	Balun, BLN-0037CE	AB
FB602	RBLN-0037CEZZ	R	Balun, BLN-0037CE	AB
FB701	RBLN-0037CEZZ	R	Balun, BLN-0037CE	AB
FB702	RBLN-0037CEZZ	R	Balun, BLN-0037CE	AB
FB751	RBLN-0037CEZZ	R	Balun, BLN-0037CE	AB
FB752	RBLN-0037CEZZ	R	Balun, BLN-0037CE	AB

<b>SWITCHES</b>				
△ S701	QSW-P0591CEZZ	R	Switch	AQ
S1001	QSW-K0077GEZZ	R	Switch, CH Up	AB
S1002	QSW-K0077GEZZ	R	Switch, CH Down	AB
S1003	QSW-K0077GEZZ	R	Switch, VOL Up	AB
S1004	QSW-K0077GEZZ	R	Switch, VOL Down	AB
S1005	QSW-K0077GEZZ	R	Switch, Picture/Preset	AB

<b>MISCELLANEOUS PARTS</b>				
RDA754	PRDAR0224PEFW	R	Heat Sink, Q602	AF
RDA756	PRDAR0248PEFW	R	Heat Sink, IC301	AF
RDA701	PRDAR0260PEFW	R	Heat Sink, IC701	AH
RDA501	PRDAR0298PEFW	R	Heat Sink, IC501 (20BM2S/G/21BM2S/G)	AF
△ FH701	QFSDH1014CEZZ	R	Fuse Holder (14BM2S/G)	AC
△ FH702	QFSDH1013CEZZ	R	Fuse Holder	AC
△ F701	QFS-C3229CEZZ	R	Fuse, T3.15A 250V	AD
J402	QJAKE0205CE04	R	Jack, 3Pin	AD
J403	QJAKE0205CE09	R	Jack, 3Pin	AD
J405	QJAKH0011AJZZ	R	Jack, 18Pin	AK
P301	QPLGN0441CEZZ	R	Plug, 4Pin	AB
P502	QPLGN0660CEZZ	R	Plug, 6Pin	AC
P602	QPLGN0641CEZZ	R	Plug, 6Pin	AB
P701	QPLGN0260CEZZ	R	Plug, 2Pin	AC
P712	QPLGN0269GEZZ	R	Plug, 2Pin	AB
P1001	QPLGN0541CEZZ	R	Plug, 5Pin	AB
P1002	QPLGN0541CEZZ	R	Plug, 5Pin	AB
RMC1001	RRMCU0235CEZZ	R	Remote Receiver	AK
TP201	QLUGP0102PEZZ	R	Lug	AA
	LHLDP1066PE00	R	Holder	AC

**DUNTK9990WEV0(14BM2S/G<sub>(n)</sub>)**  
**DUNTK9990WEV3(14BM2G)**  
**DUNTK9990WEV6(20BM2S)**  
**DUNTK9990WEV7(20BM2G)**  
**DUNTK9990WEV9(21BM2S/G)**  
**CRT UNIT**

<b>TRANSISTORS</b>				
Q870	VSBF422////-1	R	BF422	AC
Q871	VSBF422////-1	R	BF422	AC
Q872	VSBF422////-1	R	BF422	AC
Q883	VSBF421////-1	R	BF421	AC
Q885	VSBF421////-1	R	BF421	AC
Q887	VSBF421////-1	R	BF421	AC

<b>DIODES</b>				
D811	RH-DX0475CEZZ	R	DX0475CE	AB
D812	RH-DX0475CEZZ	R	DX0475CE	AB
D880	RH-DX0475CEZZ	R	DX0475CE	AB
D881	RH-DX0475CEZZ	R	DX0475CE	AB
D882	RH-DX0475CEZZ	R	DX0475CE	AB
D883	VHD1SS82///1A	R	1SS82	AC
D884	VHD1SS82///1A	R	1SS82	AC
D885	VHD1SS82///1A	R	1SS82	AC
D886	VHD1SS82///1A	R	1SS82	AC
D887	VHD1SS82///1A	R	1SS82	AC
D888	VHD1SS82///1A	R	1SS82	AC
D890	RH-EX0627GEZZ	R	Zener Diode (20BM2S/G/21BM2S/G)	AA



Ref. No.	Part No.	★	Description	Code
<b>CAPACITORS</b>				
C871	VCKYPA1HB471K	R	470p 50V Ceramic	AA
C872	VCKYPA1HB471K	R	470p 50V Ceramic	AA
C873	VCKYPA1HB471K	R	470p 50V Ceramic	AA
C875	VCKYPA2HB102K	R	1000p 500V Ceramic	AA
C876	RC-KZ0150CEZZ	R	Capacitor	AB
C878	VCEAGA2EW106M	R	10 250V Electrolytic (14BM2S/G)	AC
C878	VCEAGA2EW336M	R	33 250V Electrolytic (20BM2S/G/21BM2S/G)	AD
C880	VCKYPA1HB471K	R	470p 50V Ceramic	AA
C881	VCKYPA1HB471K	R	470p 50V Ceramic	AA
C882	VCKYPA1HB471K	R	470p 50V Ceramic	AA

<b>RESISTORS</b>				
R879	VRD-RA2BE471J	R	470 1/8W Carbon	AA
R880	VRD-RA2BE471J	R	470 1/8W Carbon	AA
R881	VRD-RA2BE471J	R	470 1/8W Carbon	AA
R882	VRS-VU3DE153J	R	15k 2W Metal Oxide	AB
R883	VRD-RM2HD272J	R	2.7k 1/2W Carbon	AA
R884	VRS-VU3DE153J	R	15k 2W Metal Oxide	AB
R885	VRD-RM2HD272J	R	2.7k 1/2W Carbon	AA
R886	VRS-VU3DE153J	R	15k 2W Metal Oxide	AB
R887	VRD-RM2HD272J	R	2.7k 1/2W Carbon	AA
R888	VRD-RA2BE471J	R	470 1/8W Carbon (14BM2S/G)	AA
R892	VRD-RA2BE102J	R	1k 1/8W Carbon	AA
R893	VRD-RA2BE102J	R	1k 1/8W Carbon	AA
R894	VRD-RA2BE102J	R	1k 1/8W Carbon	AA
R895	VRD-RA2BE471J	R	470 1/8W Carbon (20BM2S/G/21BM2S/G)	AA
R896	VRD-RA2BE471J	R	470 1/8W Carbon (20BM2S/G/21BM2S/G)	AA
R898	VRD-RA2BE471J	R	470 1/8W Carbon (14BM2S/G)	AA
R899	VRD-RA2BE471J	R	470 1/8W Carbon	AA

<b>MISCELLANEOUS PARTS</b>				
P851	QPLGN0641CEZZ	R	Plug (20BM2S/G/21BM2S/G)	AB
P851	QPLGN0661CEZZ	R	Plug, 6Pin(14BM2S/G)	AD
P882	QPLGN0541CEZZ	R	Plug (20BM2S/G/21BM2S/G)	AB
P882	QPLGN0561CEZZ	R	Plug, 5Pin(14BM2S/G)	AB
⚠ SC882	QSOCV0931CEZZ	R	Socket	AK

<b>MISCELLANEOUS PARTS</b>				
	QANTR0018PEZZ	R	Rod Antenna(14BM2S/G)	AQ
	QACCZ2008PEZZ	R	AC Cord	AM
	QCNW-2377PEZZ	R	Connecting Cord (14BM2S/G)	AE
	QCNW-2380PEZZ	R	Connecting Cord (14BM2S/G)	AG
	QCNW-2381PEZZ	R	Connecting Cord (20BM2S/G/21BM2S/G)	AG
	QCNW-2405PEZZ	R	Connecting Cord (20BM2S/G/21BM2S/G)	AE
	QCNW-2423PEN1	R	Connecting Cord (14BM2S/G)	AF
	QCNW-2433PEN1	R	Connecting Cord (20BM2S/G/21BM2S/G)	AF
	VSP1206PB50WA	R	Speaker (20BM2S/G/21BM2S/G)	AP
	VSP9050PB25WA	R	Speaker(14BM2S/G)	AM

Ref. No.	Part No.	★	Description	Code
<b>SUPPLIED ACCESSORIES</b>				
<b>ACCESSORIES</b>				
	RRMCG1342PESA	R	Infrared R-C	AU
	TINS-7170PEZZ	R	Instruction Book	AK
	QPLGJ0113CEZZ	R	Plug(14BM2S/G)	AG

**ACCESSORY (NOT REPLACEMENT ITEM)**

TCAUA0002PEZZ	-	Caution Card	—
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**PACKING PARTS  
(NOT REPLACEMENT ITEM)**

SPAKC6436PEZZ	-	Packing Case(21BM2S)	—
SPAKC6437PEZZ	-	Packing Case(21BM2G)	—
SPAKC6687PEZZ	-	Packing Case(14BM2S)	—
SPAKC6688PEZZ	-	Packing Case(14BM2G/G(y))	—
SPAKC6691PEZZ	-	Packing Case(20BM2S)	—
SPAKC6695PEZZ	-	Packing Case(20BM2G)	—
SPAKX2755PEZZ	-	Packing Add.(14BM2S/G)	—
SPAKX2756PEZZ	-	Packing Add. (20BM2S/G/21BM2S/G)	—
SSAKA0031PEZZ	-	Polyethylene Bag	—
SSAKH0015PEZZ	-	Polyethylene Bag (14BM2S/G)	—
SSAKH0016PEZZ	-	Polyethylene Bag (20BM2S/G/21BM2S/G)	—

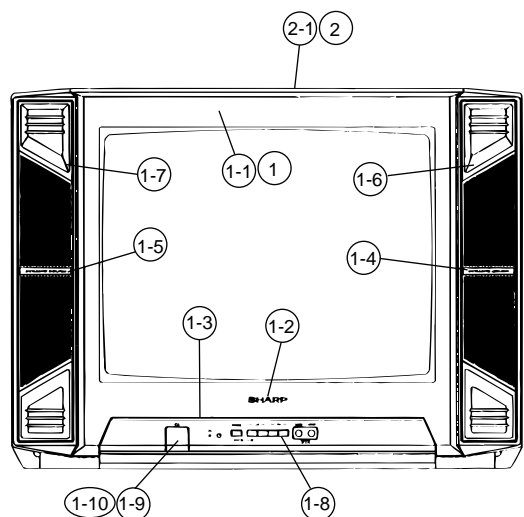
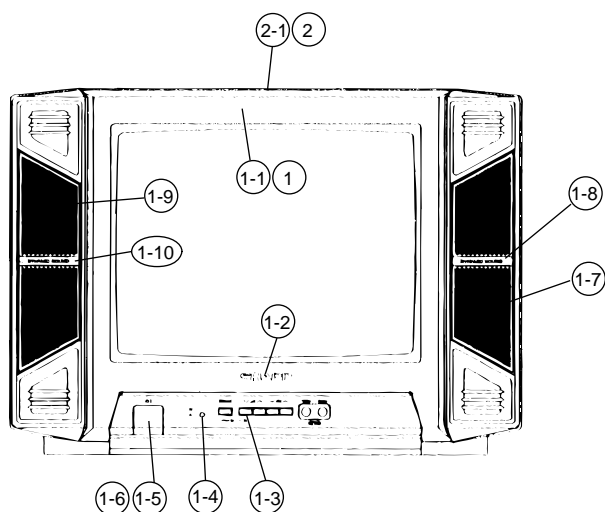
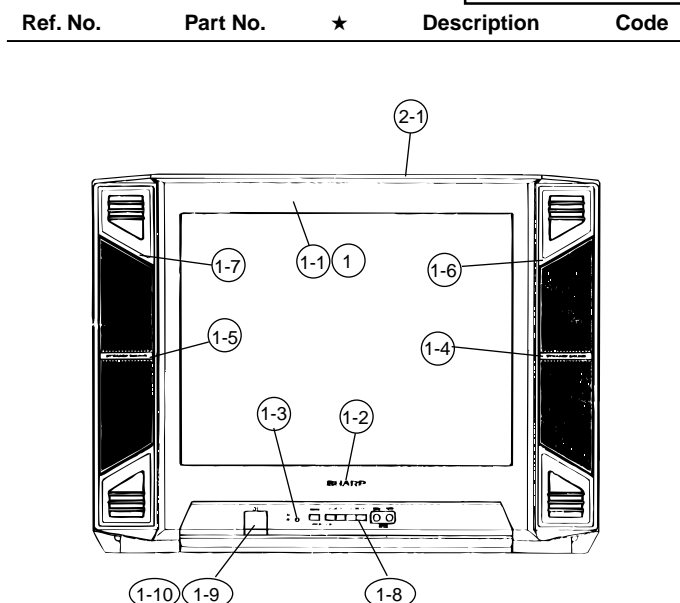
**CABINET PARTS**

<b>14BM2S/G</b>				
1	CCABA2621WEV0	R	Front Cabinet Ass'y (14BM2S)	BE
1	CCABA2621WEV1	R	Front Cabinet Ass'y (14BM2G/G(y))	BE
1-1	Not Available	-	Front Cabinet	—
1-2	HBDGB0019PESB	R	SHARP Badge	AD
1-3	JBTN-0345PESA	R	Control Button(14BM2S)	AG
1-3	JBTN-0345PESB	R	Control Button(14BM2G)	AH
1-4	HDECQ0186PESA	R	LED, R/C Cover	AD
1-5	JBTN-0346PESA	R	Power Button(14BM2S)	AD
1-5	JBTN-0346PESB	R	Power Button(14BM2G)	AD
1-6	MSPRC0068CEFW	R	Power Button Spring	AA
1-7	HDECQ0184PESA	R	Right Speaker Net	AK
1-8	HDECA0081PESA	R	Right Speaker Decoration	AE
1-9	HDECQ0185PESA	R	Left Speaker Kit	AK
1-10	HDECA0082PESA	R	Left Speaker Decoration	AE
2	CCABB2432WEV0	R	Rear Cabinet Ass'y	AX
2-1	Not Available	-	Rear Cabinet	—

<b>20BM2S/G</b>				
1	CCABA2628WEV0	R	Front Cabinet Ass'y (20BM2S)	BM
1	CCABA2628WEV1	R	Front Cabinet Ass'y (20BM2G)	BM
1-1	Not Available	-	Front Cabinet	—
1-2	HBDGB0015PESB	R	SHARP Badge	AE
1-3	HDECQ0186PESA	R	RC/LED Cover	AD
1-4	HDECA0083PESA	R	SP Decoration-R	AE
1-5	HDECA0084PESA	R	SP Decoration-L	AE
1-6	HDECQ0187PESA	R	SP NET-R(20BM2S)	AQ
1-6	HDECQ0187PESB	R	SP NET-R(20BM2G)	AQ
1-7	HDECQ0188PESA	R	SP NET-L(20BM2S)	AQ
1-7	HDECQ0188PESB	R	SP NET-L(20BM2G)	AQ
1-8	JBTN-0345PESA	R	Control Button(20BM2S)	AG
1-8	JBTN-0345PESB	R	Control Button(20BM2G)	AH
1-9	JBTN-0347PESA	R	Power Button(20BM2S)	AD
1-9	JBTN-0347PESB	R	Power Button(20BM2G)	AD



Ref. No.	Part No.	★	Description	Code
2	CCABB2434WEV0	R	Rear Cabinet Ass'y	BA
2-1	Not Available	-	Rear Cabinet	—
<b>21BM2S/G</b>				
1	CCABA2648WEV0	R	Front Cabinet Ass'y (21BM2S)	BL
1	CCABA2648WEV1	R	Front Cabinet Ass'y (21BM2G)	BL
1-1	Not Available	-	Front Cabinet	—
1-2	HBDGB0015PESB	R	SHARP Badge	AE
1-3	HDECQ0186PESA	R	RC/LED Cover	AD
1-4	HDECA0083PESA	R	SP Decoration-R	AE
1-5	HDECA0084PESA	R	SP Decoration-L	AE
1-6	HDECQ0187PESA	R	SP NET-R	AQ
1-6	HDECQ0187PESB	R	SP NET-R	AQ
1-7	HDECQ0188PESA	R	SP NET-L	AQ
1-7	HDECQ0188PESB	R	SP NET-L	AQ
1-8	JBTN-0345PESA	R	Control Button(21BM2S)	AG
1-8	JBTN-0345PESB	R	Control Button(21BM2G)	AH
1-9	JBTN-0347PESA	R	Power Button	AD
1-9	JBTN-0347PESB	R	Power Button	AD
2-1	CCABB2434WEV0	R	Rear Cabinet Ass'y	BA



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